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ABSTRACT

The development and implementation of a computer literacy support system to increase student computer use for language learning are described. The system was piloted with teachers and a computer laboratory aide in an urban program of adult basic education and English as a Second Language. The project had three phases, including: review of existing software and development of materials, with terminal competency objectives; on-site staff development workshops; and a five-week period during which students were introduced to basic computer skills by teachers, and students' use of computers before and after the teacher/aide training was tracked in activity logs. Teachers and aide were pre- and post-tested for computer skills, and computer lab activity logs were analyzed. Staff knowledge was found to have increased substantially, meeting stated objectives. However, staff who had not been computer literate previously did not gain the desired confidence in their computer usage ability. Student use of computers increased dramatically during and after the staff training period, to five times the baseline (pre-training) usage. Recommendations include repetition of the workshops for new staff, extension of the support system to serve evening classes, and adaptation of the workshop outlines for other training situations. System materials and pilot data are appended. (MSE) (Adjunct ERIC Clearinghouse on Literacy Education)

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Project CLASS: A Computer Literacy for All Support System for Teachers, Lab Aides and Potentially English Proficient Adults

by

Kathleen LaFlamme

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FL 800 345

A Practicum Report

Submitted to the Faculty of the Center for the Advancement of Education at Nova University in partial fulfillment of the requirements for the degree of Master of Science.

The abstract of this report may be placed in a National Database System for reference.

November, 1990

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Abstract

Project CLASS: A Computer Literacy for All Support System for Teachers, Lab Aides, and Potentially English Proficient Adults.
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Descriptors: Adult Basic Education/English(Second Language)/Second Language Instruction/Second Language Learning/Limited English Speaking/Bilingual Education/Computer Assisted Instruction/Educational Media/Educational Technology/Language Laboratories/Inservice Teacher Education/Teacher Effectiveness/Teacher Improvement

This report delineates the features of the computer literacy support system developed in response to the need to increase the student use of computers as a language learning option and provided by the author to the teachers and lab aide in an Adult Basic Education/English to Speakers of Other Languages program in an urban Adult Education center. The project was implemented in three consecutive phases: software review and development of systematic procedures, on-site staff development workshops, and introductory teaching/learning materials for use with Potentially English Proficient adult students. Evaluative feedback was obtained regarding software assigned at student language proficiency levels. Statistical comparison of pre- and post-tests and accrued student lab activity logs were used to measure the attainment of terminal objectives.

Authorship Statement

I hereby testify that this paper and the work it reports are entirely my own. Where it has been necessary to draw from the work of others, published or unpublished, I have acknowledged such work in accordance with accepted scholarly and editorial practice. I give this testimony freely, out of respect for the scholarship of other workers in the field and in the hope that my work, presented here, will earn similar respect.

Signed Kathleen M. La Flamme

Table of Contents

Page

Title Page..... i

Abstract..... ii

Authorship Statement..... iii

Observer Verification..... iv

Table of Contents..... v

List of Tables..... vii

List of Figures.....viii

Chapters

I. Purpose..... 1

II. Research and Solution Strategy..... 12

III. Method..... 22

IV. Results..... 28

V. Recommendations..... 48

Reference List..... 50

Appendices

Appendix A: Student Questionnaire..... 52

Appendix B: Teacher/Lab Aide Needs Assessment Questionnaire..... 53

Appendix C: Interim Feedback Report..... 57

Appendix D: Workshop Series Outlines..... 58

Appendix E: Workshop Series Pre-test..... 64

Appendix F: Workshop Series Post-test..... 66

Appendix G: Student Lab Activity Log..... 68

Appendix H: Timeline Items..... 69

Appendix I: Timeline Task and Milestone Lists..... 75

Appendix J: Software Evaluation Form..... 79

Appendix K: Student Skills Demo Form..... 81

Appendix L: Terminal Objectives Workshop Series..... 82

Appendix M: Project Evaluation Form..... 83

Appendix N: Student Selection Reasons..... 85

Appendix O: Lab Attendance Spreadsheet..... 86

Appendix P: Computer Use Spreadsheet..... 88

Appendix Q: Mean Percentage of Lab Attendance Spreadsheet..... 90

Appendix R: Percentage of Program Population Spreadsheet..... 91

List Of Tables

		Page
Table 1:	Breakdown of Program Population.....	5
Table 2:	Comparison of Test Scores Teachers With Pre-Existing Skill.....	32
Table 3:	Comparison of Test Scores Teachers Without Pre-Existing Skill..	33
Table 4:	Comparison of Test Scores Entire Teacher Group.....	34
Table 5:	Breakdown of Student Computer Use Baseline Period.....	38
Table 6:	Breakdown of Computer Use Phase Two.....	39
Table 7:	Breakdown of Computer Use Phase Three.....	40

List Of Figures

		Page
Figure 1:	Timeline Phase One Gantt Chart.....	17
Figure 2:	Timeline Phase Two Gantt Chart.....	18
Figure 3:	Timeline Phase Three Gantt Chart.....	19
Figure 4:	Percentage of Level Computer Use Phases and Overall Mean Bar Graph....	42
Figure 5:	Percentage of Population Computer Use Phases and Overall Mean Bar Graph....	43

Chapter I

Purpose

This practicum project was conducted in an Adult Basic Education/English to Speakers of Other Languages (ABE/ESOL) program which is one of many course offerings at an Adult Education center in Broward County, Florida. For the past several years, this writer has been the Inservice Facilitator at the center as well as a classroom teacher within most of the program's various levels of student English language proficiency. It is from this direct and varied experience within the program that perspective had been gained as to the opportunities afforded to students in the language lab environment, and particular potential impact had been noted with respect to computers as a learning medium.

For the purposes of this enterprise, attention was directed to the intensive daytime program with specific focus on student use of computers in the language lab component. The project was initiated to study the effects which resulted from providing teachers and lab aides with a Computer Literacy for All Support System (Project CLASS). The support system included multiple and diverse constituents,

among which were a series of on-site training workshops, the development and production of teaching/learning materials for use with Potentially English Proficient (PEP) adult students, the instigation of systematic software housekeeping procedures, and the incorporation of software into student lab syllabi.

At the time of the project's initiation, the subject program had an enrollment of 411 students aged 16 to 80, representing more than 50 countries among five continents and 35 languages. The diversity of the program's student population with respect to age, socioeconomic status, languages, cultures, interests, and values continues to reflect that of the center's overall course offerings as well as that of the community which they serve. Through the years, the center has continuously and consistently endeavored to respond to the ever-changing needs of its students in a responsible and sensitive manner. Flexibility within a relaxed and supportive atmosphere and dedication to educational excellence remain utmost priorities.

Participation in the ABE/ESOL program is of voluntary and open entry/exit on a five-hour-a-day,

five-day-a-week basis over nine-week quinmesters of forty-five days each. Instruction is available from the pre-literate level, which is geared to students with little or no pre-existing literacy skills in their native language, through the advanced level, which includes Test Of English As A Foreign Language (TOEFL) preparation. Placement in the program is based upon the student's English language proficiency as evaluated by a combination of methods including oral interview with a guidance counselor and/or the ABE/ESOL program coordinator, pre-existing records in the guidance office, score on the Test of Adult Basic Education (TABE), and observations of the assigned classroom teacher.

The competency-based curriculum is vertically sequenced and organized in a spiral and layered manner throughout the instructional levels with increased difficulty in each. The skill areas of listening, speaking, reading, and writing are integrated with equal emphasis. Teaching methodology is characteristically eclectic with no separation of form and meaning wherever possible. Learning materials are presented within a communicative framework and with as much emphasis as possible on

language as a natural outgrowth of situational context. In order to support the diversity of learning styles of the multi-aged, multilingual, and multicultural groups, teacher and student use of a wide variety of strategies, activities, media, and materials is accommodated and encouraged.

The language lab component complements classroom instruction by affording students one to five hours a week of self-paced and individualized learning opportunities. Scheduled for and accessed by all at the rate of five classes per day, the lab functions as a vital setting of the students' self-directed language acquisition efforts. By provision of a vast assortment of materials and equipment, numerous options are available to address individual language practice, reinforcement, remediation, and expansion needs. In addition, paired activities, peer tutoring, and student-teacher conferences are both easily facilitated and commonly practiced within the lab setting. The lab is therefore considered an integral and inextricable part of the program proper.

Within the last two years, five computers and more than 100 software programs have been provided in the lab for the enhancement and enrichment of

language learning activities. Due to the fact that daily class and lab attendance rates have been sustained at increasingly high levels, the introduction of computers was originally conceived to have a substantial potential impact on the nature and availability of student lab options.

At the inception of the project, the intensive ABE/ESOL daytime program consisted of ten classes:

Table 1
A Breakdown of the Program Population

Student Level:	Teacher:	Total # of Students Per Class:	Per Level:
Advanced	A	46	46
High Intermediate A	B	42	
High Intermediate B	C	52	94
Low Intermediate A	D	46	
Low Intermediate B	E	27	73
High Beginning A	F	40	
High Beginning B	G	36	76
Low Beginning A	H	52	
Low Beginning B	I	31	83
Pre-literate	J	39	39
Total Group:		411	411

As was customary, one teacher had been assigned to each class for the duration of the term and one lab aide had been assigned to regular full-time duty in the language lab. The lab aide, therefore, was to be on hand to provide assistance to any and all student

and faculty members of the program during their scheduled lab times.

A questionnaire survey of needs (Appendix A) was completed during class time by each student who was a registered and participating member of the ABE/ESOL program. Of the 46 students in the lone advanced level class (Level 4), 28 (61 percent) reported no pre-existing knowledge of basic computer skills. There were two high-intermediate classes (Level 3); one with 42 students and the other with 52. Of these groups, 30 out of 42 students and 38 of 52 (71 percent and 73 percent, respectively) acknowledged no prior experience. With regard to the two low-intermediate groups (Level 2), 41 members of a class of 46 (89 percent) and 23 students in a class of 27 (85 percent) stated they didn't know how to use computers.

All of the remaining classes combined to form Level 1 of the program. Two classes comprised the high-beginning subdivision. One group contained 40 students of which 37 (93 percent) claimed no basic computer skills. The other group had 36 students, all (100 percent) of which disclosed no ability to operate computers. In one of the low-beginning

classes, 51 of 52 students (98 percent) lacked computer skills. All 31 (100 percent) of the students in the other low-beginning class and all 39 (100 percent) of the members of the pre-literate group declared no knowledge of how to use computers. Thus, at the time the project was proposed, a problem existed in that 354 (86 percent) of the 411 total number of program participants had no perceived or demonstrable computer literacy skills.

It had been observed that the students in the ABE/ESOL program needed not only language support from their teachers and lab aide with regard to specific lesson content, but also instructional support concerning the operation and use of the technology itself. This deduction was later confirmed by the student needs survey in which a total of 388 (94 percent) of the 411 students reported that they did, in fact, require assistance. Unfortunately, many had remained unfamiliar with essential basic computer terminology and/or procedures with respect to the usage requirements of the hardware and software. Consequently, independent student attempts to utilize the equipment and materials had resulted in costly damage to the

machines and programs as well as the loss of their use for intended purposes.

As had been reported in a recent departmental survey (Appendix B), an additional problem existed in that the lab aide as well as seven of the ten ABE/ESOL teachers (73 percent, department-wide) lacked sufficient computer literacy skills to capably assist and supervise their pupils' use. Much to the dismay of the program administrators, students were clearly not receiving the benefits of computer assisted or managed instruction which had been anticipated. This had also become a source of frustration to the 391 (95 percent) students who desired to use the technology for a variety of language learning purposes and types of activities (Appendix N). Moreover, it had become cause for dissatisfaction in some of the teachers who, although intellectually aware of advantages to their being computer literate, had not yet taken the necessary steps to become so for a number of reasons.

These problems were compounded by the fact that purchased software had remained unassigned to student lab prescriptions. Neither evaluations nor synopses had been made to indicate, to students and teachers

alike, which programs would be suitable at the various levels of student English proficiency. All of the software was in need of categorization, review, and incorporation into appropriate level syllabi in accord with degree of linguistic difficulty.

Additionally, no systematic procedures had been established in order to assist the lab aide with software dissemination and collection efforts. Whereas no lag time occurs in the lab between outgoing and incoming classes, it was considered essential that efficient filing and retrieval measures be initiated and maintained.

Due to the fact that an overwhelming majority of the students had indicated interest in learning to use the computers in the lab, it was decided that the project would be best targeted at the entire ABE/ESOL program population as a single group. Because the intention of the project was to stimulate interest in computers as a lab option and enable students to use them, as opposed to measuring achievement through their usage, no persuasive argument surfaced to justify the exclusion of any of the classes from participation in the project. For recordkeeping and

manageability purposes, however, all data was to be tracked at the individual class levels.

It was to be arranged for the lab aide and all the teachers to participate in the workshop series at the same time and, wherever possible, to be paired according to student level during hands-on experience in order to assist and support each other with shared software interests. Teaching/learning materials were to be suitably designed to be used and/or adapted at all levels of student English language ability.

Based upon the expressed needs and interests of the program's administrators, faculty, staff, and participants, the desired minimum outcomes of the project would be pursued in three consecutive phases over a twelve-week period and included the following:

During the initial two-week preparatory period, all of the software was to be categorized, reviewed, and incorporated into all the student lab prescriptions according to the level of student English language proficiency required for its effective use. Students, the lab aide, and teachers were to be requested to provide feedback concerning the software and procedures used. The feedback would include, but not be limited to, whether the software

had been appropriately assigned for use at the student levels of English proficiency, and whether the software directory provided quick, easy, accurate, and sufficient support towards enabling efficient use (Appendix C).

Over the period of the subsequent five weeks, the lab aide and teachers were to attend a series of five, one-hour workshops (Appendix D) and were expected to increase their computer literacy skills by a minimum of 50 percent as measured by the score differences on criterion-referenced pre- and post-tests (Appendices E and F, respectively).

Over the final five weeks, the students were expected to increase their selection of computers as a lab option by a minimum of 50 percent as measured by a comparison of lab activity logs (Appendix G) which were to be accumulated and tabulated before and during the implementation period.

Chapter II

Research and Solution Strategy

Computer assisted instruction (CAI) and computer managed instruction (CMI) have been widely documented as having some direct and beneficial influence on student achievement and progress in a multitude of curricular emphases, not the least of which is language learning (Sayers, 1989; Clements and Nastasi, 1988; Kulik, Kulik, and Shwalb, 1986; Mehan, Moll and Riel, 1985; Diaz, 1984; McCahill, 1984; CSOS, 1983-84).

Although a large number of studies in the 1970's and early 1980's failed to exact incontrovertible empirical evidence as to the degree of CAI's effectiveness in advancing student achievement, it has since been the prevailing consensus that CAI is of at least as much derived benefit as traditional methods. It seems plausible that CAI actually involves a number of variables, particularly those in the affective domain, which are highly resistant to quantification and which do not enter into many forms of traditional delivery of instruction; hence the subsequent decline, if not lack, of conclusive studies along these lines. Nevertheless, it suffices

to say that these elusive albeit pertinent factors can be of positive influence in numerous settings and circumstances (Smith and Sherwood, 1979; Marty, 1981).

Indeed, a number of programs, local and otherwise, serving ABE/ESOL populations report high degrees of student interest in computers and that alone may account for increased achievement. By using English to learn about computers and using computers to learn about English, a number of pupils are able to maximize the benefits of learning opportunities such as those presented by and through various forms of technology. It should be noted, however, that this does not suggest that computers be the sole origin of interactive and communicative experience for language students. Rather, the provision of an environment rich in numerous and diverse choices enables the individual to select those options which are most interesting, attractive, and suitable.

As an alternative source of interactive acquisition and practice opportunities, computers in an ABE/ESOL classroom or lab can afford to their users endless patience in addition to an assortment

of activities and applications on a variety of language proficiency levels among a number of curriculum areas. But in the vast majority of studies concerning the implementation of new technology, it is the teacher who is deemed to be the most intrinsic factor in the resulting success or failure of the effort (Jex, 1988; OTA, 1987; Schcolnick, 1987; COMSIS, 1984).

As found in the COMSIS (1984) report, one of the "major impediments is...the lack of (teacher) training in the planning for and use of computers." Pointing to early efforts to focus on the development of teacher computer literacy through courses in programming, this major study concludes that most training remains deficient in the preparation of teachers to use computers with their students in the "instructional mode." (COMSIS, 1984)

While it is true that a great number of teaching professionals have taken it upon themselves to learn about computers and to use them in a variety of ways in and out of the classroom, the fact remains that the field of education has far to go before its ranks are wholly computer literate. Through informal comparison of the subject to other and somewhat

similar programs which deal with Potentially English Proficient adults, it appears offhand that there is little consistency in the percentages of computer literate instructional personnel among staffs. Those who have attained proficiency with computers have been largely self-motivated by personal interest, but a wide disparity persists.

Throughout the literature a number of reasons, including but not limited to intimidation, insecurity, and disinterest factors with respect to technology, have been offered to provide a rationale for teachers' resistance to widespread and persistent attempts through pre-service, inservice, and higher education institutions to accommodate the necessary skills development. But as mentioned by Richard Diem (1981), the ramifications of either a pre-service or mandated approach fall short of facilitating desired outcomes by virtue of their restrictive natures. In scrutiny of this multi-faceted puzzle, the missing link appeared to materialize in the form of continuous support as a training and re-training context (Fulton, 1988).

As a meager beginning to bridge the gap, the most promising solution seemed to hold forth in the

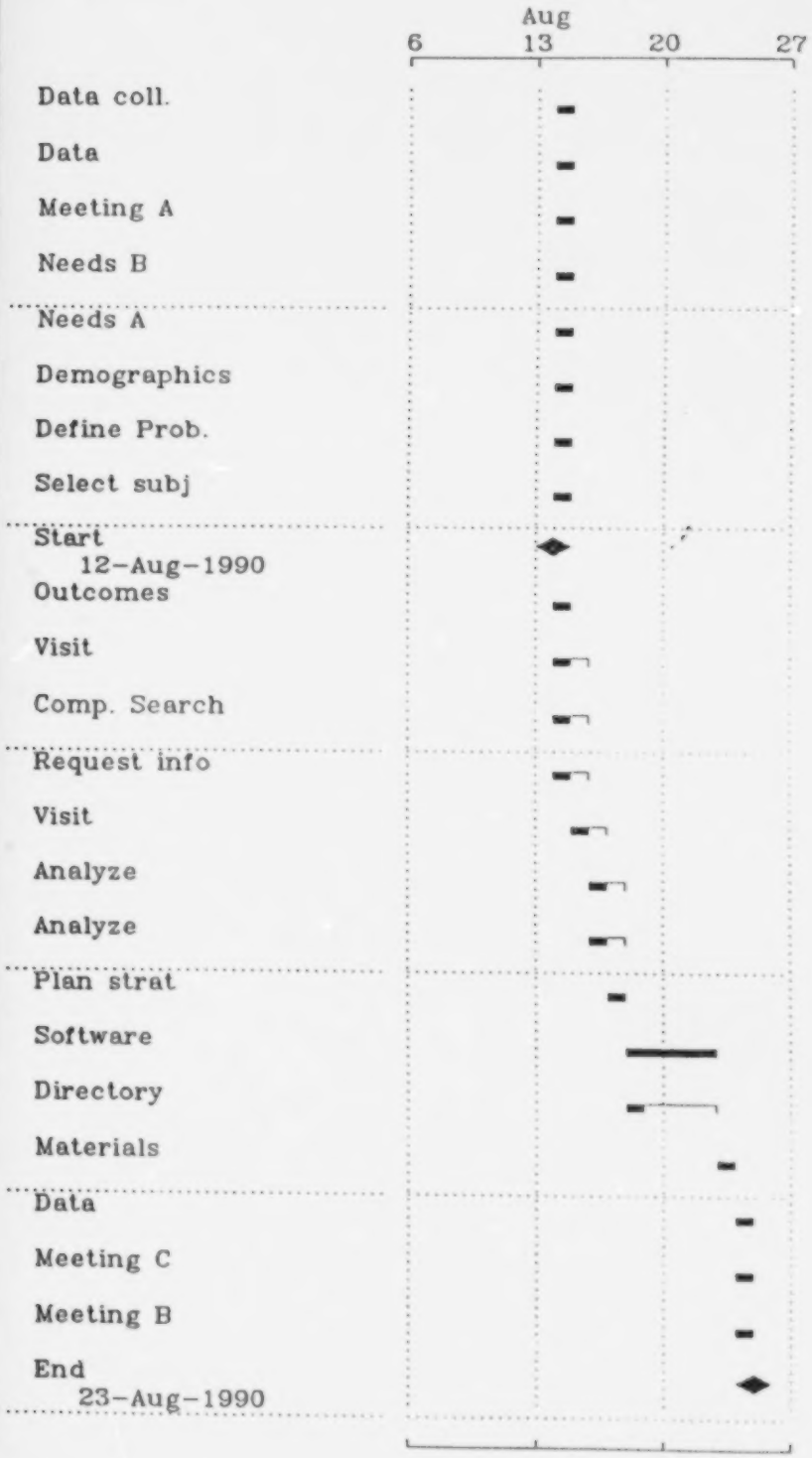
development of a support system for teachers and lab aides as based on Diem's "Inservice Training Model." Diem has described it as one that "integrates a scope and sequence of skills, as determined at the individual school level" and includes a "review of all available software in particular grade and subject matter areas."

Project CLASS then emerged as an attempt to synthesize the spirit of the referenced model, most notably with respect to its homefront initiatives, and a structured framework through which the staff's development of computer literacy skills could be accommodated in a highly relevant and meaningful manner.

The Gantt charts which follow illustrate the project's timeline, which was based on selected, planned activities (Appendices H and I) and prepared in order to methodically and efficiently schedule the various components of the project's implementation. The division of the project into three distinct and consecutive phases seemed the logical conclusion by virtue of the nature of the three greatest areas of need: housekeeping, teacher/lab aide training, and student training/monitoring.

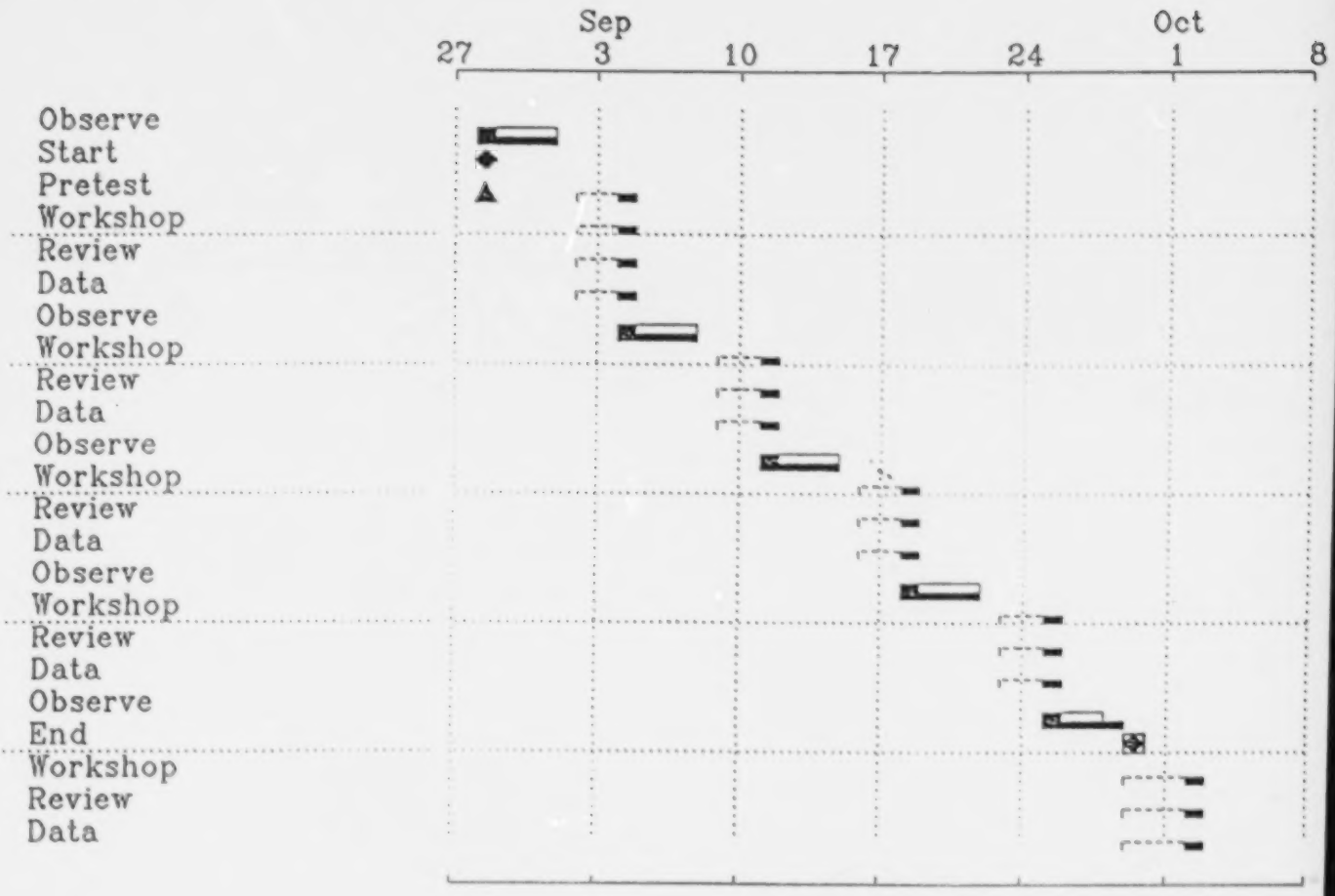
********** PHASE ONE **********

Gantt Chart

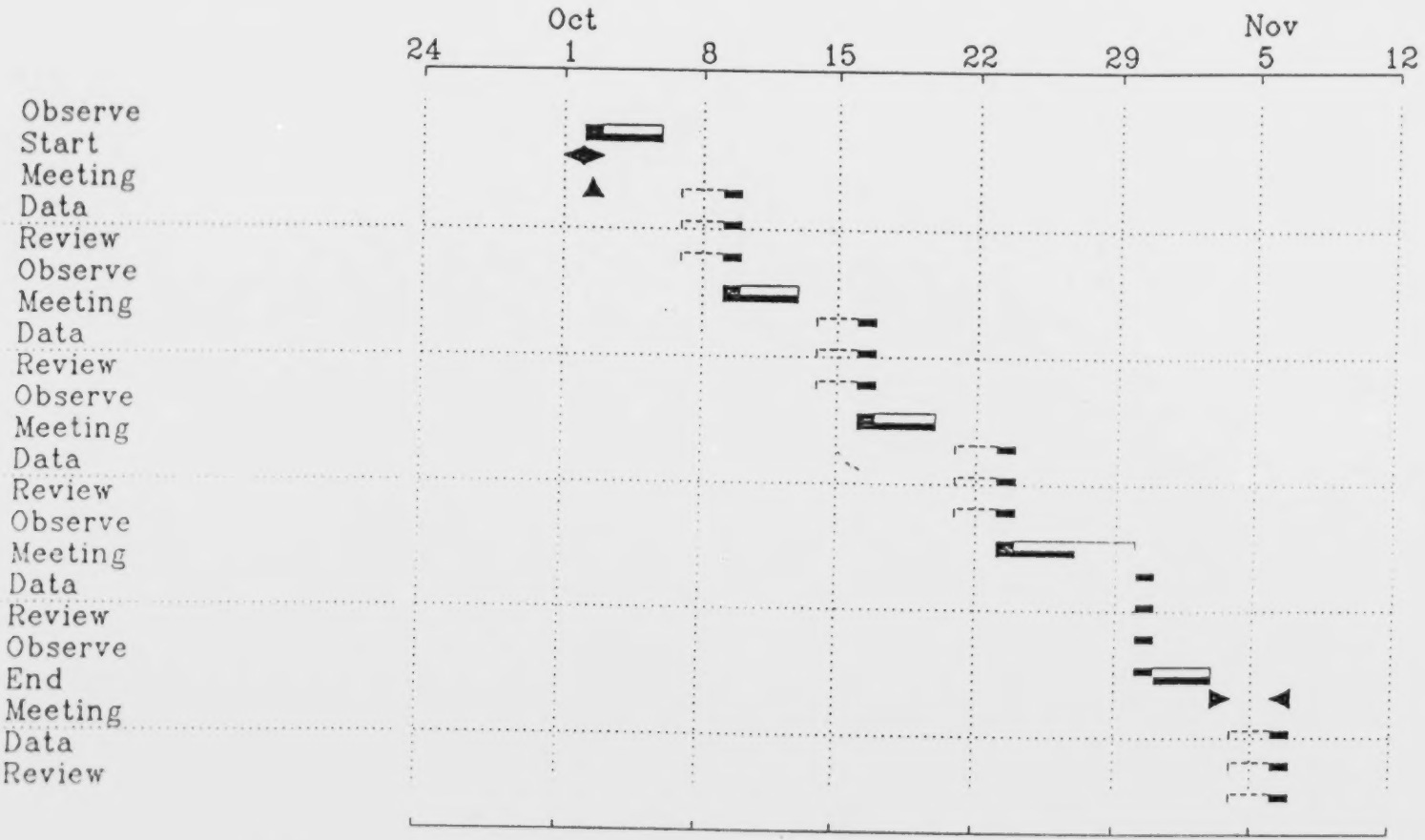


********** PHASE TWO **********

Gantt Chart



Gantt Chart


********** PHASE THREE **********
Oct
Nov
24
1
8
15
22
29
5
12
Observe
Start
Meeting
Data
Review
Observe
Meeting
Data
Review
Observe
Meeting
Data
Review
Observe
Meeting
Data
Review
Observe
End
Meeting
Data
Review

Pursuant to the need for software organization and assignment, an evaluation form (Appendix J) was developed and the following additional steps were taken during the two-week preparatory phase:

1. The software was reviewed, evaluated, and sorted by major emphasis or purpose: grammar, vocabulary, coping skills, reading, and other.

2. The software was color-coded, numbered, and incorporated into the lab prescriptions according to the degree of student language proficiency required.

3. An easy-to-read software directory, indexed by purpose and disk number, and with a separate, alphabetically ordered evaluation for each, was prepared and placed in the lab for ready access.

4. The student lab activity log was revised to improve materials dissemination and collection efforts.

To facilitate the teachers and lab aides' acquisition of computer literacy skills, a series of one-hour, on-site workshops was given over the subsequent five weeks with particular emphasis on:

1. the basic parts of the computer,

2. disk care and handling,

3. the types of software available and their applications,

4. the location and storage of equipment, and

5. hands-on experience with actual software to be used at each teacher's class level.

In order to introduce basic computer literacy skills to students, teachers were supplied with pictorial handouts, posters and transparencies, and assistance with the content and development of lesson plans for classroom presentation. The bulletin board adjacent to the computer area in the language lab was based on a computer literacy theme to serve as a teaching tool as well as a motivational device. The placards which were included in the overall design were later relocated over the computer area to be a reminder and reinforcement of operational skills.

A checklist (Appendix K) was developed for teacher/lab aide assessment and acknowledgement of individual student demonstration of the listed basic computer usage skills. A minimum of 75 percent mastery was required of a student prior to his/her independent use of hardware and software in the lab.

Chapter III

Method

Project CLASS was comprised of three consecutive phases, each with major emphasis on separate but equal areas of concern: preparation of software and materials, teacher/lab aide workshops, and student use of computers. While Phase One was expected to be completed in two weeks, it should be noted that Phases Two and Three were each targeted for a five-week period.

Phase One

Prior to the commencement of Project CLASS, this researcher met with the program administrators to discuss the scope and sequence of activities, the projected timeline, budget concerns, and the roles of faculty and staff. Approval of the project and specific permission to access the lab and equipment for materials preparation and workshops were obtained. To the extent it may have increased motivation to participate, permission was sought to conduct the workshops during time for which the teachers and lab aides would be paid. It was decided that the planning hour following the students'

dismissal would be the most convenient.

Once the necessary approval and permission were granted, this researcher revised the student lab activity log and instructed the lab aide and teachers concerning its use, reviewed the available software, prepared individual software synopses and compiled them in a software directory, sorted, color-coded and numbered the software, and incorporated it into the student lab prescriptions by program level. Student use of lab options was tabulated on a weekly basis from the student lab activity logs (Appendix G) and was accrued from the preparatory period, in order to establish a baseline of use, through the final week of the implementation period.

This researcher also prepared a list of terminal objectives (Appendix L) regarding the computer literacy competencies to be developed through the workshop series, outlines of items to be covered in each of the individual sessions (Appendix D), accompanying handouts, teaching/learning materials for classroom use, and the pre- and post-tests (Appendices E and F) to be administered in the workshop series. Due to the fact that the elements of Project Class were specific to the individual

needs of the program in which they were implemented, the use of standardized testing was ruled out in favor of instruments which more closely reflected the content of the workshop series which was given.

Finally, a meeting was held with the program coordinator and administrators for their review and approval of all products and scheduling of the workshop series.

Phase Two

A one-hour workshop was held during each of five weeks for the purposes of providing basic computer literacy skills introduction and hands-on experience to the ABE/ESOL teachers and lab aide. The workshops were conducted in the lab with the actual hardware and software which were available for regular use in the program.

During the first workshop, a criterion-referenced pre-test of basic computer literacy skills pertinent to the desired outcomes was administered to the teacher/lab aide group in order to establish a numerical score as a foundation for later comparison with the post-test. In addition, workshop content of this session presented a brief overview of the types, parts, and primary features of computers and

disks, the location and function of switches and special keyboard keys, and troubleshooting terminology. Hands-on experience was included and a computer literacy tutorial program on disk which was written by this researcher was used.

The second workshop reviewed the material of the first and further discussed disk care and handling, copyright law, the types of software available, the use of computers for instructional purposes, and the location and storage of computer equipment and materials in the lab. The lab aide and teachers again had hands-on experience with the actual in-house software which was appropriate at their student levels in order to become more familiar and comfortable with relevant materials.

Workshop Three reviewed previous content from both a teacher and student's perspective with regard to computer usage and provided opportunities to explore additional software packages.

Word processing was demonstrated during the fourth workshop, as was producing "hard copy" on the printer. This was intended to introduce the teachers and lab aide to the advantages of the computer as a time-saving device and useful tool in the development

of teacher-made materials and for other personal concerns.

A recap summary of the workshop series began the fifth and final session and major items of terminology and procedures were extracted as the basis of what to teach students about computers before they begin to use them. Pictorial handouts, posters, and transparencies were offered for classroom use and the content and development of lesson plans were discussed. Simulations of the student checkout-on-equipment procedure by a teacher or lab aide were included to provide firsthand experience, and practice in completing the checkout form was given. The administration of the post-test concluded the session, but additional access to the computers and software and assistance with lesson planning and materials were offered on an unlimited basis throughout the practicum implementation period.

Phase Three

The five-week duration of this last stage of implementation involved the introduction of computer literacy skills to the ABE/ESOL students by their respective teachers and the continued tracking of student use of computers in the lab as indicated

through the lab activity logs. Efforts to continuously provide the teachers and lab aide with necessary support and assistance with equipment, materials, and lesson plans were maintained.

Chapter IV

Results

Software, Hardware and Materials

Documentation of the software reviewed and organized during the preparatory phase is evidenced through a comparison of previous and revised lab prescriptions and the production of a software directory which includes the separate software program summaries. As the software was reviewed, it was noted that very few of the programs on hand were in the categories of coping/survival skills and reading comprehension. As budgetary considerations allow, these areas would be priorities for future preview and purchase. In addition, it may be advisable to investigate software options in content areas, such as consumer math and U.S. History and Government, as 228 (55 percent) of the students had previously responded with interest in using the computer to learn about other subjects in English.

Additionally, teacher and student feedback as to the appropriateness of the software's assignment to the student class levels was solicited in an ongoing manner throughout the project's duration, but no reassignments were suggested. Other feedback in the

form of general comments or suggestions was also requested throughout the implementation period. One teacher reported having difficulty in getting a program to accept a menu selection, but it was later determined that the caps lock key had inadvertantly been turned off and the software directory, which indicates the lock requirement, had not been consulted. The caps lock requirement was found to be very common among the in-house software selections, and the habit of checking the caps lock key first was quickly developed by students and teachers alike as a primary and valuable troubleshooting skill.

The few new materials received during the implementation period were reviewed, incorporated into the syllabi, and noted in the software directory accordingly. No requests were received pertinent to the revision of the software directory or the alteration of its contents, nor were any remarks made to indicate that the storage location of the directory or software required change. A few of the labels used to color-code and number the diskettes became loose after repeated use, but these were glued and have presented no further problem.

The lab aide's ability to easily and quickly

access the software diskettes was accommodated by the availability of locked cabinet storage directly behind the desk. For security and recordkeeping purposes, it was considered vital that students pick up, sign for, and return materials at this centralized location. No problems were experienced in this regard.

For the duration of the project, one of the five computer terminals was relocated to an area not accessible to the ABE/ESOL population. This was an administrative decision beyond the control of this researcher. However, given the nature of electronic equipment, some downtime is characteristically unavoidable and is to be expected. Few students had worked individually at a terminal in the early part of the project. Most of them expressed interest in being with a partner until they had mastered several programs. And in some circumstances, students were able to work comfortably in groups of three, rather than in pairs. At the advanced level, for example, one of the most popular programs accommodated as many as four students at a time. The resulting collaborative efforts it inspired were much enjoyed. For reasons such as this, the unanticipated reduction

of total operable equipment was judged to be unfortunate, but without a devastating, overall effect.

Teacher/Lab Aide Workshop Series

The lab aide and all the teachers attended each of the five, one-hour workshops in the series. Approximately one and a half hours were devoted to the introduction, discussion, and review of basic computer theory and terminology, the storage and use of in-house equipment and materials, and the explanation of procedures and recordkeeping forms. Teachers were given teaching/learning materials to be used in either the classroom or the lab. The main focus of the majority of these materials was disk care and handling in order to prevent the reoccurrence of disk damage. Pictorial handouts featuring the three main types of computers, the five basic parts of a microcomputer system, and the keyboard layout were distributed. The latter proved to be very popular with a number of students who were found, on several occasions, to be using the paper copy for typing practice when they were away from the computers.

An additional thirty minutes was spent during

scheduled workshop time on the required testing. The pre-test was administered to the teacher-lab aide group at the commencement of the series. The post-test was given to the group at the conclusion of the twelve-week implementation period; that is, five weeks after the last workshop was conducted, and ten weeks after the pre-test.

Comparison of the score differences and direct observation were used to determine the extent of the lab aide and teachers' acquisition of the terminology and procedures deemed fundamental to the use of the specific hardware and software available in the lab. Of the three teachers who had indicated they had become computer literate prior to the project, scores on the post-test illustrated a mean increase of 20 percent.

Table 2

A Comparison of Test Scores for Teachers With Pre-Existing Computer Skills

Participant:	Pre-test Score:	Post-test Score:	Score Difference:
Teacher B	90	100	10
Teacher C	80	100	20
Teacher D	70	100	30
Group Mean:	80.00	100.00	20.00

The remainder of the group showed significant gain by virtue of a positive total increase of 74 percent on the post-test. Because the content of the tests closely reflected that of the workshop series, the extent of basic factual knowledge acquired by the group with little to no pre-existing skills or training is considered weighty.

Table 3
A Comparison of Test Scores for Teachers With No Pre-Existing Computer Skills

Participant:	Pre-test Score:	Post-test Score:	Score Difference:
Teacher A	40	100	60
Teacher E	15	100	85
Teacher F	35	100	65
Teacher G	55	100	45
Teacher H	0	100	100
Teacher I	0	95	95
Teacher J	25	100	75
Lab Aide	30	100	70
Group Mean:	25.00	99.38	74.38

When combined, the total group's pre-test mean of 40 percent was increased to 99% on the post-test. This signifies a vast improvement and well meets the intended objectives for the individuals as well as for the group in its entirety.

Table 4

A Comparison of Test Scores for Entire Teacher Group

Participant:	Pre-test Score:	Post-test Score:	Score Difference:
Teacher A	40	100	60
Teacher B	90	100	10
Teacher C	80	100	20
Teacher D	70	100	30
Teacher E	15	100	85
Teacher F	35	100	65
Teacher G	55	100	45
Teacher H	0	100	100
Teacher I	0	95	95
Teacher J	25	100	75
Lab Aide	30	100	70
Group Mean:	40.00	99.55	59.55

Approximately three of the five hours of the workshop series were devoted to hands-on experience with the actual hardware and software in the language lab. All the participants initially used a computer literacy tutorial program which had been created by this researcher. The program introduces the three major types of computers, proceeds to present graphics and information concerning the five main parts of a microcomputer system, and includes an in-program review and test.

The hands-on experience of using the tutorial program enabled the participants to simultaneously learn about and use the various keyboard keys and

other designated features. Once it was discovered that the caps lock key needed to be on for a correct response to be accepted, all participants scored 100 percent on the tutorial test.

It was observed that the lab aide and all the teachers were able to perform, with 100 percent accuracy, the specified behavioral objectives concerning the identification of hardware and software objects and features. Similarly, all were able to successfully meet the stated requirements of independently loading and running a software program.

In addition, all the participants demonstrated the ability to verbally express knowledge of the copyright law and the educator's reponsibilities in protecting software from unauthorized use or copying.

One of the drawbacks of the project was found to be the length of time allocated for the preview of software. Several of the teachers expressed interest in spending additional time with software to be used at their students' level and at a time when support would be available. Due to the dense student population in each class, the scheduled lab times are often quickly absorbed by the routine logistics of assigning, disseminating, and collecting materials,

correcting tests, and conferencing with students. It seems advisable, if not imperative, to recognize the need to reinforce, maintain, and extend acquired skills by offering regularly scheduled, on-site follow-up sessions. These would not be permanently necessary on a weekly basis, but might well begin with a one-hour session per week on a voluntary-attendance basis and taper off to one or two meetings a month as needed. Off-site inservice workshops should be sought out as well and taken advantage of by those who are able to attend. New skills and information could then be brought back to the workplace and shared.

Student Use of Computers

Due to limitations of space and time, not all of the classes were able to attend lab each day. Also, it should be noted that individual classes were not scheduled for equal amounts of lab time each week. Furthermore, not every student attended class each and every day, nor were all students of the class present on days for which their lab time had been set. In view of the foregoing, the accumulated data may be analyzed from two perspectives; first, with respect to the number of students in attendance at

the time of lab (Appendices P and Q) and again, with respect to the total program population as established during the baseline period (Appendix R).

Throughout the project, data concerning the student selection of the computer as a lab option were accrued by means of a combination of student self-reporting through the survey questionnaires (Appendix A), direct observation during lab times by this researcher, and comparison of the student lab activity logs (Appendix G).

Baseline data were generated during the two-weeks of preparatory Phase One through the student survey questionnaires and the lab activity logs. Despite the high interest which had been initially expressed by the students, the lab logs verified the students' self-reports on the survey, which indicated minimal to no computer use among the individual classes. Although 57 of the program population of 411 (14 percent) stated they knew how to use computers, a total of only 17 (4 percent) reported actual use during this time. The reason for the discrepancy becomes apparent in the examination of the staggering figure of 388 (94 percent) students who claimed they needed the teacher or lab aide's assistance.

Table 5

A Breakdown of Baseline Period Computer Use

Student Level:	# in Class	Used	Wanted to use	Knew How	Needed Help
Advanced	46	5	44	18	46
High Int. A	42	2	42	12	36
High Int. B	52	3	50	14	45
Low Int. A	46	1	46	5	44
Low Int. B	27	4	25	4	26
High Beg. A	40	2	31	3	34
High Beg. B	36	0	36	0	36
Low Beg. A	52	0	47	1	51
Low Beg. B	31	0	31	0	31
Pre-literate	39	0	39	0	39
Total:	411	17	391	57	388
Group Mean:	41.1	1.7	39.1	5.7	38.8
% of Population:	100	4	95	14	94

Interim data were collected for the five-week phase during which the teachers and lab aide participated in the workshop series. A spreadsheet of the number of students attending lab on the individual dates during the Phase Two and Phase Three periods is provided for reference in Appendix O. An additional spreadsheet with a breakdown of the actual number of students using computers in the lab for the same stages follows in Appendix P. The mean percentage of attending students using computers is detailed according to individual classes and is

presented in Appendix Q. As summarized in the following table, the student selection of computers as a lab option did undergo an increase through this stage, but was most predominantly noted among the higher levels.

Table 6

A Breakdown of Phase Two Computer Use

	# of Students Using Computers:				
Student Level:	Wk.1	Wk.2	Wk.3	Wk.4	Wk.5
Advanced	7	16	21	17	34
High Int. A	4	8	9	17	21
High Int. B	4	11	13	11	19
Low Int. A	0	5	21	10	14
Low Int. B	4	4	15	7	16
High Beg. A	0	0	4	0	2
High Beg. B	0	2	6	4	3
Low Beg. A	0	0	2	4	2
Low Beg. B	0	2	3	2	0
Pre-literate	0	0	0	0	2
Group Total:	19	48	94	72	113
Group Mean:	1.9	4.8	9.4	7.2	11.3
% of Population:	5	12	23	18	27

At the outset of the project, the lab aide and the group of lower level teachers, i.e. pre-literate through high-beginning, had claimed the least amount of pre-existing computer skills. The very slight and gradual change depicted among the lower level classes parallels and is, therefore, most predictably

attributable to, the incremental and cumulative introduction of terminlogy and skills and the provision of practice to the lab aide and those teachers.

Final phase data were collected and tabulated at the conclusion of the implementation period. This information represents student computer use after the lab aide and teachers had completed the workshop series and during the last five weeks the project was in effect.

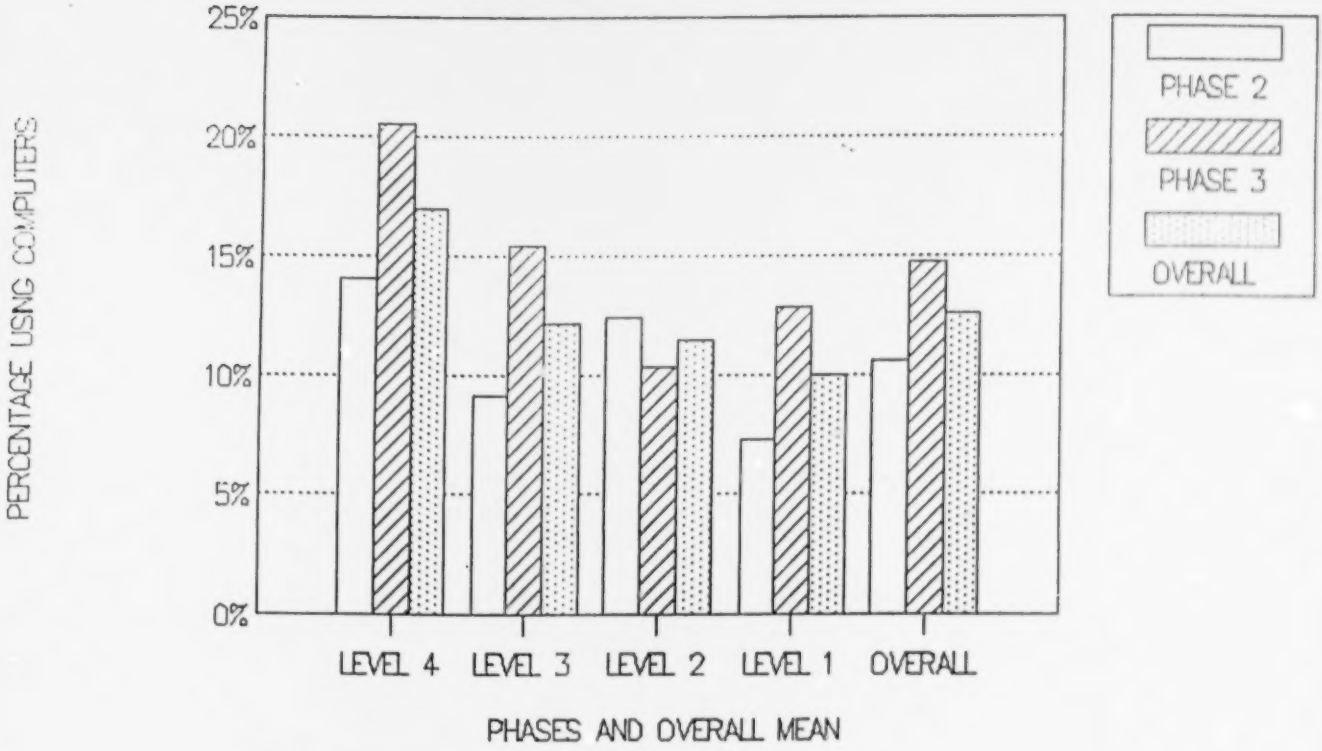
Table 7

A Breakdown of Phase Three Computer Use

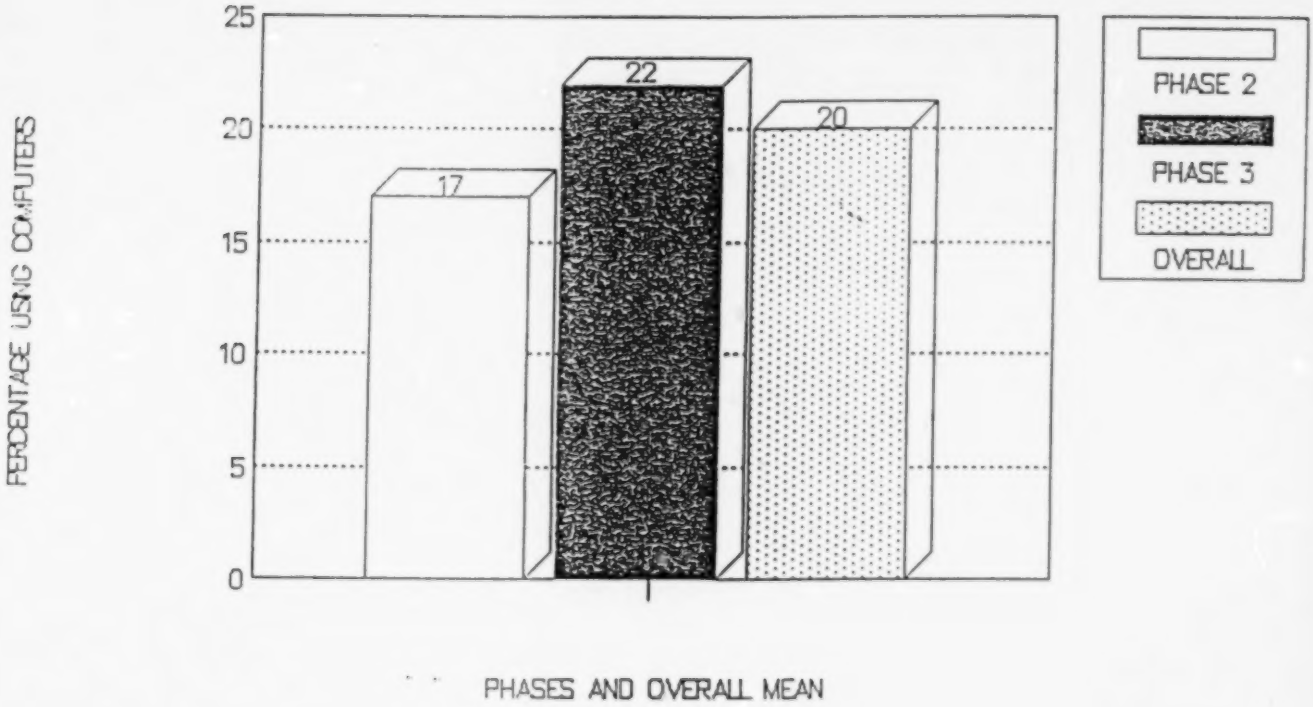
Student Level:	Wk.6	Wk.7	Wk.8	Wk.9	Wk.10
Advanced	30	27	16	29	17
High Int. A	22	23	20	18	19
High Int. B	20	22	20	14	10
Low Int. A	12	8	2	7	2
Low Int. B	10	9	7	7	10
High Beg. A	2	0	4	0	3
High Beg. B	4	4	5	2	4
Low Beg. A	4	4	4	6	0
Low Beg. B	2	2	0	5	0
Pre-literate	0	4	4	0	0
Total:	106	103	82	88	65
Group Mean:	10.6	10.3	8.2	8.8	6.5
% of Population:	26	25	20	21	16

Although there appears to be a drop-off in the momentum as gained by the groups in the fourth and eighth weeks, it should be noted that both of these were short weeks of four days each, due to days off. The tenth and final week contained the Halloween holiday, which resulted not only in the lab being closed for afternoon festivities, but also had caused a number of students in all the classes to be absent from lab for holiday preparations during the early part of that week. The lower figures, therefore, do not necessarily represent a diminished interest in using the computers. On the contrary, measurable data throughout the project indicate a steady positive increase. By the end of Phase Two, which coincided with the conclusion of the lab aide/ teacher training, the mean number of students using the computers was 69 per week, for an average of 17 percent of the total program population. During Phase Three, the mean number of students selecting computers was 89 per week, representing an average of 22 percent of the target student population. The overall mean usage was 20 percent: five times the baseline usage.

MEAN PERCENTAGE OF STUDENTS USING COMPUTERS



PERCENTAGE OF POPULATION USING COMPUTER



These figures well exceed the original intended outcomes and are more gratifying by virtue of the fact that spot checks of computer use in the lab support sustained or higher levels of use. It is expected that this trend will continue as additional students and their teachers become even more comfortable with the equipment and available software materials.

The project evaluation which was conducted by means of open discussion and by written evaluation (Appendix M) at the conclusion of the implementation period substantively showed that some affective factors were positively influenced as the result of participation in the project. For example, the lab aide and all of the teachers reported receiving positive feedback from the students concerning their use of computers in the lab. Also, a number of the teachers expressed pleasure in that they were able to offer the computer as an alternative to their students, particularly at those times when the student requested to use it, or when attendance was high.

Although not entirely unexpected, the most notable disappointments were the facts that five

(50 percent) of the ten instructional participants stated, after they had completed the training, that they did not feel more comfortable using computers for the preparation of teaching/learning materials, and three (30 percent) reiterated their lack of confidence while supervising and assisting students using computers. These teachers were among the group which had reported no previous skill or experience.

The fact that none of the participants resisted the opportunity to acquire computer knowledge and skill leads to the conclusion that strides can be made towards the goal of literacy attainment where there is willingness, but that substantial and continued support and practice are needed in order to inspire and facilitate the recognition of competence. As pointed out by Joyce and Showers (1988), "if transfer of training is the training objective, follow-up such as coaching in the workplace will probably be necessary." Through the experience of Project CLASS, it does indeed appear imperative that continuous support and assistance be available to the teacher or lab aide while skills are being acquired and through such time as proficiency is developed.

Project CLASS was originally envisioned as an

opportunity to organize computer materials, equipment and procedures to augment available lab options and, insofar as they have been utilized by any students for this purpose, the housekeeping efforts have proven to be successful. All of the hardware and software have been made easily and readily accessible to those who desire to use it.

Additionally, the project endeavored to condense and present basic computer skills which were of specific relevance and usefulness to the teachers and lab aide of the subject adult ABE/ESOL program. This, in turn, was intended to facilitate the transfer of computer skills to the students, who had expressed strong desire to use the technology in their language acquisition efforts. In both of these respects, the direct observation of computer use in the lab points to far greater progress than does the modest acknowledgement of the faculty and staff. Despite the reluctance of some of the teachers to admit the extent of their achievement, they are now able to assign software, and supervise and assist in its use by students at all levels of English language proficiency within the program.

Gaining confidence in a new area of expertise,

quite simply, takes a long time and involves a great deal of effort and practice. Although the relatively short duration of the project precluded the novice from attaining mastery of all but the most primary of operational skills, it has nevertheless sufficed as an effective beginning in which the intended goals that comprised the basic premise of the project were met. Furthermore, it is believed that the project has served as an enticement and encouragement of future possibilities. The faculty, staff, and students of the ABE/ESOL program deserve no less.

Chapter VII

Recommendations

Pending administrative approval, immediate plans to apply the successful elements of Project CLASS include repetition of the workshop series during the daytime, due to the fact that three classes have since been added to the subject ABE/ESOL program. The teachers who have recently joined the program have confided that they lack computer literacy skills.

Also recommended is the extension of the support system so that it may benefit the center's evening program in either modified or full form as needed. Beyond that, the teaching/learning materials may be disseminated along with guidelines for use at other instructional sites.

Similarly, the training workshop outlines may be useful in the planning and conducting of future inservice offerings which could be customized for individual needs and initiated at parallel sites. In the aggregate, the duplication of products and the consolidated descriptions of processes may result in eventual referral to the county for consideration of usefulness in off-campus programs or as a basis for

the development of a computer component to the existing ABE/ESOL curriculum.

In a broader sense, the project may have implications for similar adult ESOL programs throughout the country. Therefore, a condensed version may be subsequently submitted to such organizations as TESOL International, the National Clearinghouse for Bilingual Education (NCBE), and/or the Center for Applied Linguistics for possible inclusion in their publications.

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Test of Adult Basic English (TABE)

Test of English as a Foreign Language (TOEFL)

Student Questionnaire

This questionnaire is for you to give us some information about the computers in the language lab.

Please **DO NOT** write your name on this paper.

Please answer **ALL** the questions. **Circle** your choice for each answer.

1. Do you now use the computers in the language lab?

   yes no

2. Do you want to use the computers in the lab?

   yes not sure no

3. Do you already know how to use a computer?

   yes no

4. Do you need help from the teacher or lab aide to use the computers in the lab?

   yes no

5. Why do you want to use the lab computers?

   Circle the letter for **ALL** true answers. You may choose as many as you like:

   a. to learn and practice vocabulary

   b. to learn and practice grammar

   c. to learn and practice reading skills

   d. to learn about other subjects in English

   e. to play educational games

   f. to type letters or compositions

   g. to learn more about computers

   h. other: _____

Your answers are VERY IMPORTANT to us!

Thank you for your help!

Appendix A

To: ABE/ESOL Teachers and Lab Aides
Re: Use of Computers in the Language Lab

This questionnaire has been prepared to obtain information about the use of the computers in the ABE/ESOL Language Lab. The results will indicate areas of future staff development efforts that will be of interest and benefit to you.

Please DO NOT sign your name so that your answers may remain CONFIDENTIAL. It is important that you provide an accurate answer to every question.

Thank you for your assistance!

Please circle the number which most closely corresponds to YOUR opinion or feeling:

1=Strongly agree 2=Slightly agree 3=Undecided

4=Slightly disagree 5=Strongly disagree

1. I use the computers in the language lab.	1	2	3	4	5
2. I can identify the five basic parts of a microcomputer and explain their functions.	1	2	3	4	5
3. I know the location and function of their on/off switches and warning indicators.	1	2	3	4	5
4. I know the location and function of the special keyboard keys.	1	2	3	4	5
5. I know basic computer terms for operation and use.	1	2	3	4	5
6. I know the do's and do not's of disk care and handling.	1	2	3	4	5
7. I know what to do when error messages appear or programs stall.	1	2	3	4	5
8. I know the coyright law concerning software.	1	2	3	4	5
9. I know the five types of software used for instruction.	1	2	3	4	5
10. I know what the hardware in the lab consists of, how and where it is stored.	1	2	3	4	5
11. I am able to instruct and assist students concerning the computer hardware in the lab.	1	2	3	4	5
12. I know what the software collection in the lab consists of and where it is stored.	1	2	3	4	5
13. I know how the software is filed and categorized.	1	2	3	4	5

Appendix B

1=Strongly agree 2=Slightly agree 3=Undecided

4=Slightly disagree 5=Strongly disagree

14. I know where the software manuals are stored.	1	2	3	4	5
15. The directions in the manuals are easy to understand and follow.	1	2	3	4	5
16. I know what supplemental materials are available and where they are stored.	1	2	3	4	5
17. I know how to use the software in the lab to provide computer assisted instruction (CAI) to students.	1	2	3	4	5
18. I feel comfortable supervising and assisting students with CAI at my current level of expertise.	1	2	3	4	5
19. I know how to use the software in the lab for computer managed instruction (CMI).	1	2	3	4	5
20. I feel comfortable using CMI at my current level of expertise.	1	2	3	4	5
21. I am aware that teachers can access many software programs to modify or manipulate content for student use.	1	2	3	4	5
22. I know which programs in the lab have teacher-access capability.	1	2	3	4	5
23. I am able to access, modify and manipulate the content of such programs in the lab.	1	2	3	4	5
24. I am able to use the computers in the lab to generate lessons, worksheets and tests.	1	2	3	4	5
25. I feel sufficiently prepared to use the computers in the lab.	1	2	3	4	5
26. I consider myself to be computer literate.	1	2	3	4	5
27. I have taken a computer literacy course.	1	2	3	4	5
28. I have taken more than one computer course.	1	2	3	4	5
29. I have attended a computer literacy workshop.	1	2	3	4	5
30. I have completed more than one computer workshop.	1	2	3	4	5
31. A lack of time has prevented me from taking computer courses or workshops.	1	2	3	4	5
32. The locations of computer classes or workshops have prevented me from taking them.	1	2	3	4	5

Appendix B

1=Strongly agree 2=Slightly agree 3=Undecided

4=Slightly disagree 5=Strongly disagree

33. I have not taken computer courses or workshops because I expect them to be too difficult or technical. 1 2 3 4 5
34. I have not taken computer courses or workshops because I think they won't really help me. 1 2 3 4 5
35. I have not taken computer courses or workshops for financial reasons. 1 2 3 4 5
36. Some other reason has prevented me from taking computer courses or workshops. 1 2 3 4 5

Please state the reason:

_____

37. I feel that computers could be useful to me. 1 2 3 4 5
38. I feel that computers could be useful to students.
39. It would help me to learn very basic information about using the computers in the lab. 1 2 3 4 5
40. It would help me to have an orientation workshop at my work site for this purpose. 1 2 3 4 5
41. It would help me to know the types of software in the lab and how they are categorized for student use. 1 2 3 4 5
42. It would help me to have a workshop at my work site for this purpose. 1 2 3 4 5
43. It would help me if the software manuals were summarized with easy-to-read instructions. 1 2 3 4 5
44. It would help me to learn how to modify programs for individual student use. 1 2 3 4 5
45. It would help me to have a workshop at my work site for this purpose. 1 2 3 4 5
46. It would help me to have hands-on experience with software that the students would be using. 1 2 3 4 5
47. It would help me to have a workshop at my work site to obtain this experience. 1 2 3 4 5
48. It would help me to learn what to teach students about using the computers in the lab. 1 2 3 4 5

Appendix B

1=Strongly agree 2=Slightly agree 3=Undecided

4=Slightly disagree 5=Strongly disagree

49. It would help me to have a workshop at my work site for this purpose.	1	2	3	4	5
50. It would help me to learn how to use the computers to prepare lessons, worksheets and tests.	1	2	3	4	5
51. It would help me to have a workshop at my work site for this purpose.	1	2	3	4	5
52. I would attend a computer workshop series to learn ONLY what is really necessary to assist students in lab.	1	2	3	4	5
53. I would attend if it were conducted at my work site immediately before my work hours.	1	2	3	4	5
54. I would attend if it were conducted at my work site immediately after my work hours.	1	2	3	4	5
55. I would attend if it were conducted ONLY during time for which I would be paid.	1	2	3	4	5

Your answers are very important! Thank you for your cooperation!

Appendix B

Project CLASS

Software Assignment/Operation

Please use this form to report any problems/concerns you may have with the hardware or software in the language lab.

1. Software assigned to your student level:

   too difficult? _____

   too easy? _____

   recommended change: _____

   _____

   other comments: _____

   _____

2. Problem with operation of hardware/software:

   Please describe: _____

   _____

   _____

3. Other problem/concern/comment:

   Please describe: _____

   _____

   _____

Appendix C

Project CLASS: Computer Literacy Workshop Series

Workshop One:

I. Introduction to workshop series
   A. Welcome
   B. Purpose
   C. Schedule
   D. Attendance
   E. Survey questionnaire
   F. Pre-test

II. Introduction to computers
   A. The friendly computer
   B. Definition of computer
   C. Types of computers
      1. Mainframe
      2. Minicomputer
      3. Microcomputer
   D. The five basic parts of a microcomputer
      1. Keyboard
      2. Disk drive
      3. CPU (central processing unit)
      4. Monitor
      5. Printer
   E. Input/Output
      1. Definitions
      2. Functions of five basic parts
         a. Keyboard: input
         b. Disk drive: input/output
         c. CPU: input/output
         d. Monitor: output
         e. Printer: output
   F. Floppy disk
      1. What it is
      2. What it does
   G. Location and function
      1. On/off switches
      2. Special indicators
      3. Special keyboard keys
   H. Useful computer terms for troubleshooting
      1. "To boot" a disk
      2. "To reboot" a disk
      3. "To crash" a disk
      4. "Break in line #_"
      5. I/O Error
   I. Hands-on experience
      1. Run "Computer Literacy" tutorial program
      2. Take test in program

Project CLASS: Computer Literacy Workshop Series

Workshop Two:

I. Review of Workshop One's main points
   A. Names of five basic parts of computers
   B. Location and function
      1. On/off switches
      2. Special indicators
      3. Special keyboard keys

II. Disk care and handling
   A. Review of floppy disk
      1. What it is
      2. What it does
   B. Software Do's and Do Not's
      1. Illustrated handouts
      2. Rationale
   C. Copyright Law
      1. What it is
      2. Responsibilities

III. Using the computer for instructional purposes
   A. Types of software on the market
      1. Drill and practice
      2. Tutorial
      3. Simulation/Demonstration
      4. Games
      5. Applications
   B. Available in-house software
      1. What it is
         a. "Canned" software
         b. MECC software
      2. Where it is located
      3. How it is cataloged
      4. How it is incorporated into lab prescriptions
      5. How it is stored
         a. Manuals
         b. Supplemental materials
      6. How it is accessed
   C. Computer Assisted Instruction (CAI)
      1. What it is
      2. Bare facts needed to begin using it
         a. Location of program content info
         b. How to modify/manipulate content
   D. Computer Managed Instruction
      1. What it is
      2. Bare facts needed to begin using it
         a. Location of student tracking info
         b. How to access student records
   E. Hands-on experience with in-house software

Appendix D

F. Review of troubleshooting
    1. What error messages are
    2. What to do when they appear

Appendix D

Project CLASS: Computer Literacy Workshop Series

Workshop Three

I. Review of previous workshop material
   A. Workshop One's main points
   B. Workshop Two's main points

II. Hands-on experience
   A. From student's perspective
   B. From teacher's perspective

Appendix D

Project CLASS: Computer Literacy Workshop Series

Workshop Four:

I. Review of previous workshop material

II. Hands-on experience
    A. Introduction to word processing
    B. Introduction to "hard copy"

Appendix D

Project CLASS: Computer Literacy Workshop Series

Workshop Five:

I. Introduction of computer literacy skills to students
   A. What to teach students about computers
      1. hardware
         a. names of parts
         b. locations of on/off switches
         c. getting help
      2. software
         a. how to access
         b. keyboard keys needed to run
         c. getting help
      3. disk care and handling
         a. do's and do not's
         b. advising teacher/lab aide of trouble
      4. glossary of basic terms
      5. motivating factors
   B. Simulation
      1. checking-out students on equipment
      2. assisting students with problems
   C. Recap summary of workshop contents
   D. Questions, answers, suggestions and comments
   E. Post-test
   F. Project Evaluation
   G. Thanks

Project CLASS:
Computers in the Language Lab Workshops

Pre-Test

Name:_____ Date:_____

Fill in the blanks to complete each statement:

1. The five basic parts of the microcomputer are:
   a. _____
   b. _____
   c. _____
   d. _____
   e. _____
2. A diskette is also called a disk or a _____.
3. The _____ window on a disk should NEVER be touched.
4. The _____ is the ONLY place where a disk should be handled.
5. To "_____" a disk is the term used to mean "turn on" or "activate" it.
6. The disk is put in the disk drive with the _____ facing up.
7. It is important that the disk drive door is _____ before the computer is turned on.
8. It is important NOT to press keys on the keyboard when the _____ of the disk drive is on.
9. The _____ key is used to get the computer to "read" what has been typed.

Appendix E

10. To run many of the software disks in the lab, it is important to be sure that the "_____ _____" key is down.
11. The type of software most commonly used in computer assisted instruction is _____ and _____.

True or False:

12. _____ Only a felt tip pen should be used to write on a disk.
13. _____ Turn off the computer to exit a program.
14. _____ Press the "Space Bar" key to "turn the page" in most software programs.
15. _____ Place disks on top of the monitor or disk drive when they are not in use.

Project CLASS:
Computers in the Language Lab Workshops

Post-Test

Name:_____ Date:_____

Fill in the blanks to complete each statement:

1. The five basic parts of the microcomputer are:
   a. _____
   b. _____
   c. _____
   d. _____
   e. _____
2. A diskette is also called a disk or a _____.
3. The _____ window on a disk should NEVER be touched.
4. The _____ is the ONLY place where a disk should be handled.
5. To "_____" a disk is the term used to mean "turn on" or "activate" it.
6. The disk is put in the disk drive with the _____ facing up.
7. It is important that the disk drive door is _____ before the computer is turned on.
8. It is important NOT to press keys on the keyboard when the _____ of the disk drive is on.
9. The _____ key is used to get the computer to "read" what has been typed.

Appendix F

10. To run many of the software disks in the lab, it is important to be sure that the "_____ _____" key is down.
11. The type of software most commonly used in computer assisted instruction is _____ and _____.

True or False:

12. _____ Only a felt tip pen should be used to write on a disk.
13. _____ Turn off the computer to exit a program.
14. _____ Press the "Space Bar" key to "turn the page" in most software programs.
15. _____ Place disks on top of the monitor or disk drive when they are not in use.

TEACHER: _____ DATE: _____

STUDENT	CASSETTE RECORDER	LANGUAGE MASTER	COMPUTER	TEST	OTHER	MATERIALS USED

Appendix G

TIMELINE ITEMS

Project: CLASS

To be implemented in three consecutive phases over a total of a minimum of twelve weeks.

Implementation Phase One: (two to four weeks)

1. discuss with administrators/get approval
2. obtain demographics
3. develop teacher/lab aide needs assessment instrument (survey questionnaire)
4. develop student needs assessment instrument (survey questionnaire)
5. pre-test assessment instruments/get feedback/revise as needed
6. conduct needs assessments
7. tabulate results/analyze data/relate to population
8. define problem
   a. evidence (needs assessments, lab logs, photos)
   b. determine target/accessible population
   c. select subjects (as randomly as possible)
   d. scope
   e. generalizability
   f. goal enhancement
9. determine measurable outcome objectives
10. conduct review of literature
    a. list ERIC descriptors
    b. submit request for computer search: Nova IRS
    c. request to NCBE
    d. request to Center for Applied Linguistics
    e. request to U.S. Dept. of Education
    f. request to MFRC, FAU-Boca Raton
    g. request to International Reading Assn.
    h. request to TESOL
    i. visit univ. libraries
11. visit other sites
12. analyze lit. and other sites' experiences
    a. similarities
    b. differences
13. determine previous solution strategies
14. establish case for selection
    a. theory
    b. philosophy
    c. practicality
15. rule out unsuccessful strategies

16. select from successful strategies documented
17. develop innovative solution strategy for use in subject setting
    a. administrative cooperation
    b. faculty/staff cooperation
    c. time constraints
    d. budget constraints
    e. researcher's role
    f. criteria and methods of evaluation
18. preview existing software in the lab
19. sort/catalog/color-code/number all software
20. incorporate software into lab prescriptions re: degree of linguistic difficulty/student levels
21. prepare easy-to-read instructions re: software
    a. operation
    b. use
    c. teacher access re:recordkeeping/modification
22. compile, alphabetically sort in directory
23. determine terminal objectives for workshop series
24. develop teacher/lab aide workshop series outline
25. develop pre-test for workshop series
26. develop post-test for workshop series
27. develop feedback form re: software problems/comments
28. develop and adapt instructional materials/handouts/tutorial software
29. develop activity log for student use of lab media/materials
30. instruct teachers and lab aide re;use of log
31. instigate use of log/accumulate baseline data
32. develop checklist for teachers/lab aides to check out students before they use the computers
33. prepare project evaluation form
34. consider making a video presentation for classroom use to demonstrate to students what to do/not do
    a. turning the computer equipment on/off
    b. disk care and handling
    c. following on-screen instructions
35. obtain or make bulletin board materials
    a. immediate use in lab
    b. later use in classrooms or as visual aids
36. tabulate baseline data from accrued lab activity logs
37. meet with program coordinator and administrators to outline and discuss project
    a. scope and sequence
    b. projected timeline
    c. budget concerns

Appendix H

d. permission for researcher's access
   1. to lab
   2. to computer equipment and software
   3. to video camera
   4. to faculty/staff during their planning time
e. roles of faculty and staff
f. approval of products
g. scheduling of workshops

38. meet with faculty and staff to explain project
   a. purpose
   b. procedure
   c. expected outcomes

Implementation Phase Two: (five weeks)

Week One:

1. conduct and tabulate results of teacher/lab aide pre-test
2. observe computer use in lab per observation schedule
3. conduct Workshop One
4. review week's activities to prepare for Week #2

Week Two:

1. collect and tabulate activity logs from Week #1
2. observe computer use in lab per observation schedule
3. conduct Workshop Two
4. review week's activities to prepare for Week #3

Week Three:

1. collect and tabulate activity logs from Week #2
2. observe computer use in lab per observation schedule
3. conduct Workshop Three
4. review week's activities to prepare for Week #4

Week Four:

1. collect and tabulate activity logs from Week #3
2. observe computer use in lab per observation schedule
3. conduct Workshop Four
4. review week's activities to prepare for Week #5

Week Five:

1. collect and tabulate activity logs from Week #4
2. observe computer use in lab per observation schedule
3. conduct Workshop Five
4. review activities of preceding five weeks to prepare for Phase Two of Implementation period

Appendix H

Implementation Phase Three: (five weeks)

Week Six:

1. collect and tabulate activity logs from Week #5
2. observe computer use in lab per observation schedule
3. conduct meeting with teachers/lab aides
    a. questions
    b. problems
    c. feedback
4. review week's activities to prepare for Week #7

Week Seven:

1. collect and tabulate activity logs from Week #6
2. observe computer use in lab per observation schedule
3. conduct meeting with teachers/lab aides
    a. questions
    b. problems
    c. feedback
4. review week's activities to prepare for Week #8

Week Eight:

1. collect and tabulate activity logs from Week #7
2. observe computer use in lab per observation schedule
3. conduct meeting with teachers/lab aides
    a. questions
    b. problems
    c. feedback
4. review week's activities to prepare for Week #9

Week Nine:

1. collect and tabulate activity logs from Week #8
2. observe computer use in lab per observation schedule
3. conduct meeting with teachers/lab aides
    a. questions
    b. problems
    c. feedback
4. review week's activities to prepare for Week #10

Week Ten:

1. collect and tabulate activity logs from Week #9
2. observe computer use in lab per observation schedule
3. conduct meeting with teachers/lab aides
    a. questions
    b. problems
    c. feedback
4. conduct and tabulate results of post-test to teachers/lab aides
5. conduct project evaluation
6. perform data analysis
7. analyze evaluations
8. prepare final report

Appendix H

Task & Milestone List

Task name	Description	Planned duration	Planned start	Planned finish
Data coll.	Prepare data collection form:lab activity log.	0.10 Dys W	13-Aug-1990	13-Aug-1990
Data	Instruct lab aide and commence use: lab activity log.	0.10 Dys W	13-Aug-1990	13-Aug-1990
Meeting A	Meet with administrators to dicuss/approve project.	0.10 Dys W	13-Aug-1990	13-Aug-1990
Needs B	Develop assessment instrument for teachers.	0.10 Dys W	13-Aug-1990	13-Aug-1990
Needs A	Develop assessment instrument for students.	0.10 Dys W	13-Aug-1990	13-Aug-1990
Demographics	Obtain demog. info/stats. re: program.	0.25 Dys W	13-Aug-1990	13-Aug-1990
Select subj	Determine target/accessible population.	0.25 Dys W	13-Aug-1990	13-Aug-1990
Define Prob.	Scope/generalizability/goal enhancement/measurability.	0.25 Dys W	13-Aug-1990	13-Aug-1990
Start			13-Aug-1990	13-Aug-1990
Outcomes	Determine measurable outcome objectives.	0.10 Dys W	13-Aug-1990	13-Aug-1990
Visit	library research.	1.00 Dys W	13-Aug-1990	14-Aug-1990
Request info	Request info:NCBE/Ctr.Applied. Ling./US Dept.Ed./MFRC/IRA/TESOL.	0.25 Dys W	13-Aug-1990	14-Aug-1990
Comp. Search	List ERIC descriptors/req. search IRS.	0.20 Dys W	13-Aug-1990	14-Aug-1990
Visit	Visit other sites' programs/labs.	1.00 Dys W	14-Aug-1990	15-Aug-1990
Analyze	Analyze other sites' experience.	0.25 Dys W	15-Aug-1990	16-Aug-1990
Analyze	Review literature.	0.75 Dys W	15-Aug-1990	16-Aug-1990
Plan strat	Review/eliminate/select/devise solution strategy.	0.50 Dys W	16-Aug-1990	17-Aug-1990
Software	Review/sort/assign/evaluate/color-code/number/assign.	3.00 Dys W	17-Aug-1990	22-Aug-1990
Directory	Compile/alphabetize software summaries.	0.50 Dys W	17-Aug-1990	17-Aug-1990

Task & Milestone List

Task name	Description	Planned duration	Planned start	Planned finish
Materials	Develop/adapt/purchase materials for workshops, classes, etc.	1.00 Dys W	22-Aug-1990	23-Aug-1990
Data	Collect/tabulate baseline data re:computer use.	0.50 Dys W	23-Aug-1990	23-Aug-1990
Meeting C	Meet with administrators re:project details/approval/schedule workshops.	0.10 Dys W	23-Aug-1990	23-Aug-1990
Meeting B	Meet with lab aide/teachers re: project purpose, procedures, etc.	0.10 Dys W	23-Aug-1990	23-Aug-1990
End			24-Aug-1990	24-Aug-1990

Task & Milestone List

Task name	Description	Planned duration	Planned start	Planned finish
Start			27-Aug-1990	27-Aug-1990
Observe	Observe and record computer use in lab.	0.50 Dys W	27-Aug-1990	27-Aug-1990
Pretest	Administer to lab aide/teachers/tabulate responses.	0.10 Dys W	3-Sep-1990	3-Sep-1990
Workshop	Conduct Workshop #1.	0.25 Dys W	3-Sep-1990	3-Sep-1990
Review	Review Week #1 activities.	0.10 Dys W	3-Sep-1990	3-Sep-1990
Data	Collect/tabulate activity logs from Week #1.	0.25 Dys W	3-Sep-1990	3-Sep-1990
Observe	Observe and record computer use in lab per schedule.	0.50 Dys W	3-Sep-1990	4-Sep-1990
Workshop	Conduct Workshop #2.	0.25 Dys W	10-Sep-1990	10-Sep-1990
Review	Review activities of Week #2.	0.10 Dys W	10-Sep-1990	10-Sep-1990
Data	Collect/tabulate activity logs from Week #2.	0.25 Dys W	10-Sep-1990	10-Sep-1990
Observe	Observe and record computer use in lab per schedule.	0.50 Dys W	10-Sep-1990	11-Sep-1990
Workshop	Conduct Workshop #3.	0.25 Dys W	17-Sep-1990	17-Sep-1990
Review	Review activities of Week #3.	0.10 Dys W	17-Sep-1990	17-Sep-1990
Data	Collect/tabulate activity logs from Week #3.	0.25 Dys W	17-Sep-1990	17-Sep-1990
Observe	Observe and record computer use in lab per schedule.	0.50 Dys W	17-Sep-1990	18-Sep-1990
Workshop	Conduct Workshop #4.	0.25 Dys W	24-Sep-1990	24-Sep-1990
Review	Review activities of Week #4.	0.10 Dys W	24-Sep-1990	24-Sep-1990
Data	Collect/tabulate activity logs from Week #4.	0.25 Dys W	24-Sep-1990	24-Sep-1990
Observe	Observe and record computer use in lab per schedule.	0.50 Dys W	24-Sep-1990	25-Sep-1990
End			28-Sep-1990	28-Sep-1990
Workshop	Conduct Workshop #5.	0.25 Dys W	1-Oct-1990	1-Oct-1990
Review	Review activities of Week #5.	0.10 Dys W	1-Oct-1990	1-Oct-1990
Data	Collect/tabulate activity logs from Week #5.	0.25 Dys W	1-Oct-1990	1-Oct-1990

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Task & Milestone List

Task name	Description	Planned duration	Planned start	Planned finish
Start			1-Oct-1990	1-Oct-1990
Observe	Observe and record computer use in lab per schedule.	0.50 Dys W	1-Oct-1990	1-Oct-1990
Meeting	Meet with lab aide/teachers re: problems, questions, feedback.	0.10 Dys W	8-Oct-1990	8-Oct-1990
Data	Collect/tabulate activity logs from Week #6.	0.25 Dys W	8-Oct-1990	8-Oct-1990
Review	Review activities of Week #6.	0.10 Dys W	8-Oct-1990	8-Oct-1990
Observe	Observe computer use in the lab per schedule.	0.50 Dys W	8-Oct-1990	8-Oct-1990
Meeting		0.10 Dys W	15-Oct-1990	15-Oct-1990
Data	Collect/tabulate activity logs from Week #7.	0.25 Dys W	15-Oct-1990	15-Oct-1990
Review	Review activities of Week #7.	0.10 Dys W	15-Oct-1990	15-Oct-1990
Observe	Observe computer use in lab per schedule.	0.50 Dys W	15-Oct-1990	15-Oct-1990
Meeting	Meet with lab aide/teachers.	0.10 Dys W	22-Oct-1990	22-Oct-1990
Data	Collect/tabulate activity logs from Week #8.	0.25 Dys W	22-Oct-1990	22-Oct-1990
Review	Review activities of Week #8.	0.10 Dys W	22-Oct-1990	22-Oct-1990
Observe	Observe computer use in lab per schedule.	0.50 Dys W	22-Oct-1990	22-Oct-1990
Meeting	Meet with lab aide/teachers.	0.10 Dys W	29-Oct-1990	29-Oct-1990
Data	Collect/tabulate activity logs from Week #9.	0.25 Dys W	29-Oct-1990	29-Oct-1990
Review	Review activities of Week #9.	0.10 Dys W	29-Oct-1990	29-Oct-1990
Observe	Observe computer use in lab per schedule.	0.50 Dys W	29-Oct-1990	29-Oct-1990
End			2-Nov-1990	2-Nov-1990
Meeting	Meet with lab aide/teachers.	0.10 Dys W	5-Nov-1990	5-Nov-1990
Data	Collect/tabulate activity logs from Week #10.	0.25 Dys W	5-Nov-1990	5-Nov-1990
Review	Review activities of Week #10.	0.10 Dys W	5-Nov-1990	5-Nov-1990

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SOFTWARE EVALUATION

Title: _____

Publisher: _____ Copyright Date: _____

Type: Drill & Practice:_____ Simulation/Demo:_____

Tutorial:_____ Game:_____ Other:_____

Teacher Access:

yes:_____ management:_____ modification:_____

no:_____ tips:_____

Competency area:

grammar:_____ vocabulary:_____ reading:_____

coping skill:_____ other:_____

Student language level: (Check ALL which apply)

Pre-lit:_____ Low-Beg.:_____ High-Beg.:_____

Low-Int.:_____ High-Int.:_____ Advanced:_____

Number of Users at Same Time:

One:_____ Two:_____ Three or More:___

Program Components:

No. of Disks:____ Manual:_____ Worksheets:_____

Post-tests:_____ Student roster:_____

Hardware Required: Apple II: Apple DOS:_____

48K:_____ 64K:_____ 128K:_____ More:_____

Disk drives: One:____ Two:____

Peripherals: Printer:____ Color Monitor:____ Other:_____

Student typing skills needed:_____

Teacher/Lab aide supervision needed:_____

Directions always on screen:_____

Time delay before program prompts:_____

Appendix J

Keyboard keys used to run program:

Alphabet:_____ Space bar:_____ Return:_____

Left/right arrows:_____ Up/down arrows:_____

Other:_____

Must the "caps lock" be on to operate:_____

"Exact match" of keys/info requested:_____

Exit any time: yes:_____ no:_____

Escape directions:_____

Additional Information/Comments: _____

_____

_____

_____

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Teacher or Lab Aide: Use only the **Practice Disk** during student demonstration of the following competencies. The student must demonstrate **ALL** of the competencies before independently using the computers during Lab. Sign off on each competency by placing your initials and the date as mastery of each competency is demonstrated.

Student Name: _____

This student is able to:	Initials:	Date:
1. Gently pick up and hold disk at label end.	_____	_____
2. Identify the disk drive.	_____	_____
3. Identify the monitor.	_____	_____
4. Identify the keyboard.	_____	_____
5. Identify the computer (cpu).	_____	_____
6. Insert disk face up into disk drive.	_____	_____
7. Close disk drive door.	_____	_____
8. Turn on monitor.	_____	_____
9. Turn on computer (cpu).	_____	_____
10. Identify numerical keys.	_____	_____
11. Identify alphabet keys.	_____	_____
12. Identify return key.	_____	_____
13. Identify space bar.	_____	_____
14. Identify caps lock key.	_____	_____
15. Identify arrow keys.	_____	_____
16. Type name on keyboard.	_____	_____
17. Open disk drive door.	_____	_____
18. Remove disk from disk drive.	_____	_____
19. Return disk to jacket.	_____	_____
20. Turn off computer (cpu).	_____	_____
21. Turn off monitor.	_____	_____
22. Return disk to Lab Aide's desk.	_____	_____

Appendix K

Project CLASS

Computer Literacy Terminal Objectives

The Workshop Series Participant will:

1. name the five basic parts of a microcomputer system (keyboard, disk drive, central processing unit, monitor, printer) on a completion test with a minimum of 80% accuracy.

2. identify basic computer terminology concerning hardware, software, their handling, and use on a completion test with a minimum of 80% accuracy.

3. identify the five basic parts of a microcomputer system by pointing them out with a minimum of 80% accuracy during a physical demonstration.

4. locate the on/off switches and warning indicators on available hardware with 100% accuracy during a physical demonstration.

5. follow stated procedures for disk care and handling with 100% accuracy during a physical demonstration.

6. locate the software storage area in the language lab with 100% accuracy during a physical demonstration.

7. locate the software directory and the evaluation of a piece of software within the directory with 100% accuracy during a physical demonstration.

8. demonstrate the ability to turn on a computer, boot a disk, run a program, provide input by typing responses on a keyboard, end a program, and return software to the designated storage area with 100% accuracy during a physical demonstration.

9. orally state with 100% accuracy an acknowledgement of copyright law pertaining to software and the responsibilities of professional educators to uphold such law.

Appendix L

Project CLASS Evaluation

Please circle your responses to the following:

1. Have you learned new information about computers by participating in the project?

yes not sure no

2. Have you learned the basics necessary to supervise and assist students with computer use in the language lab?

yes not sure no

3. Do you now feel more comfortable in supervising and assisting students with computers?

yes not sure no

4. Do you now feel more comfortable about using computers in order to prepare teaching/learning materials or using it for personal reasons?

yes not sure no

5. Have the students expressed positive feedback about their use of computers in the lab?

yes not sure no

6. Have you previewed or used any of the software?

yes not sure no

7. Have you found any of the software to be incorrectly assigned to a student level?

yes not sure no

Appendix M

8. Have you used the software directory?

yes not sure no

9. If so, have you found it to be quick and easy?

yes not sure no

10. accurate? yes not sure no

11. sufficient? yes not sure no

12. Do you have any comments concerning the project or suggestions for improving the features of the project (software, workshops, handouts or other materials, etc.)

yes not sure no

If yes, please share:

_____

_____

_____

_____

_____

_____

Thank you for your participation!

Appendix M

Student Reasons for Selection of Computers as a Learning Option in the Language Lab

A= learn and practice vocabulary
B= learn and practice grammar
C= learn and practice reading skills
D= learn about other subjects in English
E= play educational games
F= type letters or compositions
G= learn more about computers

Number of Responses on Student Questionnaire

Student Level:	A:	B:	C:	D:	E:	F:	G:
Advanced	39	38	32	32	15	29	35
High Int. A	35	42	27	33	14	27	35
High Int. B	44	45	29	34	12	12	27
Low Int. A	44	43	32	26	18	17	39
Low Int. B	20	18	16	18	10	17	21
High Beg. A	37	32	21	18	8	10	27
High Beg. B	32	32	30	29	19	22	27
Low Beg. A	47	32	33	22	23	19	27
Low Beg. B	27	24	23	21	6	16	24
Pre-literate	33	36	23	27	18	26	31
Total:	358	342	266	260	143	195	293
Group Mean:	35	34	27	26	14	20	29
Percent of Total Student Population:	87	83	65	63	35	47	71

Reasons as Ranked by Total Student Population:

1. A= learn and practice vocabulary (87%)
2. B= learn and practice grammar (83%)
3. G= learn more about computers (71%)
4. C= learn and practice reading skills (65%)
5. D= learn about other subjects in English (63%)
6. F= type letters or compositions (47%)
7. E= play educational games (35%)

Appendix N

Appendix O

STUDENTS ATTENDING LAB: PHASE TWO

DATE	ADVANCED	H.I. A	H.I. B	L.I. A	L.I. B	H.B. A	H.B. B	L.B. A	L.B. B	PRE-LIT	LEVEL 4	LEVEL 3	LEVEL 2	LEVEL 1	ATTENDING STUDENTS TOTAL
08/27/90	27.0	33.0	35.0	20.0						15.0	27.0	68.0	20.0	15.0	130.0
08/28/90	17.0	35.0	32.0		32.0		23.0				17.0	67.0	32.0	23.0	139.0
08/29/90	44.0	40.0		32.0	24.0			19.0			44.0	40.0	56.0	19.0	159.0
08/30/90	41.0	38.0	39.0		23.0	19.0					41.0	77.0	23.0	19.0	160.0
08/31/90	44.0	39.0		24.0					22.0		44.0	39.0	24.0	22.0	129.0
09/04/90	42.0	43.0	18.0		24.0		28.0				42.0	61.0	24.0	28.0	155.0
09/05/90	28.0	42.0		31.0	25.0			28.0			28.0	42.0	56.0	28.0	154.0
09/06/90	31.0	38.0	31.0		24.0	18.0					31.0	69.0	24.0	18.0	142.0
09/07/90	42.0	21.0		24.0					25.0		42.0	21.0	24.0	25.0	112.0
09/10/90	18.0	36.0	31.0	38.0						28.0	18.0	67.0	38.0	28.0	151.0
09/11/90	17.0	38.0	37.0		25.0		28.0				17.0	75.0	25.0	28.0	145.0
09/12/90	26.0	40.0		26.0	30.0			34.0			26.0	40.0	56.0	34.0	156.0
09/13/90	21.0	32.0	33.0		29.0	22.0					21.0	65.0	29.0	22.0	137.0
09/14/90	34.0	26.0		31.0					20.0		34.0	26.0	31.0	20.0	111.0
09/17/90	15.0	34.0	32.0	24.0						22.0	15.0	66.0	24.0	22.0	127.0
09/18/90	15.0	40.0	33.0		25.0		29.0				15.0	73.0	25.0	29.0	142.0
09/19/90	30.0	41.0		33.0	39.0			32.0			30.0	41.0	72.0	32.0	175.0
09/21/90	34.0	38.0		24.0					21.0		34.0	38.0	24.0	21.0	117.0
09/24/90	20.0	39.0	36.0	28.0						18.0	20.0	75.0	28.0	18.0	141.0
09/25/90	24.0	33.0	36.0		29.0		25.0				24.0	69.0	29.0	25.0	147.0
09/26/90	28.0	38.0		27.0	28.0			36.0			28.0	38.0	55.0	36.0	157.0
09/27/90	27.0	39.0	40.0		30.0	23.0					27.0	79.0	30.0	23.0	159.0
09/28/90	52.0	26.0		24.0					14.0		52.0	26.0	24.0	14.0	116.0
PHASE TWO MEAN	28.2	34.5	33.3	27.6	27.6	20.5	26.6	29.8	20.4	20.8	25.1	46.7	28.6	20.3	120.8

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Appendix O

STUDENTS ATTENDING LAB: PHASE THREE

DATE	ADVANCED	H.I. A	H.I. B	L.I. A	L.I. B	H.B. A	H.B. B	L.B. A	L.B. B	PRE-LIT	LEVEL 4	LEVEL 3	LEVEL 2	LEVEL 1	ATTENDING STUDENTS TOTAL
10/01/90	22.0	38.0	38.0	27.0						19.0	22.0	76.0	27.0	19.0	144.0
10/02/90	16.0	33.0	42.0		32.0		21.0				16.0	75.0	32.0	21.0	144.0
10/03/90	24.0	36.0		27.0	31.0			33.0			24.0	36.0	58.0	33.0	151.0
10/04/90	26.0	34.0	32.0		26.0	26.0					26.0	66.0	26.0	26.0	144.0
10/05/90	40.0	29.0		21.0					21.0		40.0	29.0	21.0	21.0	111.0
10/08/90	15.0	28.0	31.0	30.0						16.0	15.0	59.0	30.0	16.0	120.0
10/09/90	19.0	38.0	36.0		25.0		25.0				19.0	74.0	25.0	25.0	143.0
10/10/90	26.0	32.0		26.0	21.0			27.0			26.0	32.0	47.0	27.0	132.0
10/11/90	33.0	35.0	40.0		24.0	21.0					33.0	75.0	24.0	21.0	153.0
10/12/90	46.0	29.0		28.0					23.0		46.0	29.0	28.0	23.0	126.0
10/15/90	17.0	38.0	26.0	29.0	22.0					20.0	17.0	64.0	51.0	20.0	152.0
10/16/90	20.0	32.0	38.0		24.0		23.0				20.0	70.0	24.0	23.0	137.0
10/17/90	30.0	30.0		23.0	22.0			28.0			30.0	30.0	45.0	28.0	133.0
10/18/90	27.0	32.0	35.0			22.0					27.0	67.0	0.0	22.0	116.0
10/22/90	27.0	27.0	33.0	25.0						19.0	27.0	60.0	25.0	19.0	131.0
10/23/90	19.0	18.0	30.0		26.0		22.0	34.0			19.0	48.0	26.0	56.0	149.0
10/24/90	23.0	31.0		25.0	25.0						23.0	31.0	50.0	0.0	104.0
10/25/90	23.0	27.0	34.0	27.0	22.0	18.0					23.0	61.0	49.0	18.0	151.0
10/26/90	43.0	24.0		24.0					24.0		43.0	24.0	24.0	24.0	115.0
10/29/90	22.0	27.0	28.0	27.0						20.0	22.0	55.0	27.0	20.0	124.0
10/30/90	14.0	30.0	26.0		22.0		23.0				14.0	56.0	22.0	23.0	115.0
10/31/90	24.0	28.0		21.0	21.0			24.0			24.0	28.0	42.0	24.0	118.0
11/01/90	24.0	28.0	23.0		15.0	14.0					24.0	51.0	15.0	14.0	104.0
PHASE THREE MEAN	25.2	30.6	32.8	22.5	23.9	20.2	22.8	29.2	22.7	18.8	21.5	44.3	26.6	19.4	111.7
OVERALL MEAN	26.7	32.6	33.1	25.0	25.8	20.4	24.7	29.5	21.5	19.8	23.3	45.5	27.6	19.9	116.3

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Appendix P

STUDENTS USING COMPUTERS: PHASE TWO

DATE	ADVANCED	H.I. A	H.I. B	L.I. A	L.I. B	H.B. A	H.B. B	L.B. A	L.B. B	PRE-LIT	LEVEL 4	LEVEL 3	LEVEL 2	LEVEL 1	TOTAL STUDENTS USING COMPUTER
08/27/90											0.0	0.0	0.0	0.0	0.0
08/28/90			2.0		2.0						0.0	2.0	2.0	0.0	4.0
08/29/90	2.0										2.0	0.0	0.0	0.0	2.0
08/30/90	3.0		2.0		2.0	2.0					3.0	2.0	2.0	2.0	9.0
08/31/90	2.0	2.0									2.0	2.0	0.0	0.0	4.0
09/04/90	2.0	2.0	4.0				2.0				2.0	6.0	0.0	2.0	10.0
09/05/90	4.0	4.0		2.0	2.0						4.0	4.0	4.0	0.0	12.0
09/06/90	4.0	1.0	7.0		2.0						4.0	8.0	2.0	0.0	14.0
09/07/90	6.0	1.0		3.0					2.0		6.0	1.0	3.0	2.0	12.0
09/10/90	2.0	4.0	1.0	5.0	6.0						2.0	5.0	11.0	0.0	18.0
09/11/90	2.0	5.0	5.0		5.0		6.0				2.0	10.0	5.0	6.0	23.0
09/12/90	9.0			6.0	4.0			2.0			9.0	0.0	10.0	2.0	21.0
09/13/90	3.0		7.0			4.0					3.0	7.0	0.0	4.0	14.0
09/14/90	5.0			10.0					3.0		5.0	0.0	10.0	3.0	18.0
09/17/90	1.0	3.0	8.0	4.0							1.0	11.0	4.0	0.0	16.0
09/18/90	3.0	6.0	3.0		3.0		4.0				3.0	9.0	3.0	4.0	19.0
09/19/90	6.0	4.0		6.0	4.0			4.0			6.0	4.0	10.0	4.0	24.0
09/21/90	7.0	4.0							2.0		7.0	4.0	0.0	2.0	13.0
09/24/90	3.0	6.0	7.0	6.0						2.0	3.0	13.0	6.0	2.0	24.0
09/25/90	6.0	4.0	6.0		6.0		3.0				6.0	10.0	6.0	3.0	25.0
09/26/90	10.0	3.0		4.0	6.0			2.0			10.0	3.0	10.0	2.0	25.0
09/27/90	7.0	6.0	6.0		4.0	2.0					7.0	12.0	4.0	2.0	25.0
09/28/90	8.0	2.0		4.0							8.0	2.0	4.0	0.0	14.0
PHASE TWO MEAN	4.3	3.4	4.5	4.2	3.5	2.7	3.8	2.7	2.3	2.0	3.5	4.3	3.6	1.5	12.8

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Appendix P

STUDENTS USING COMPUTERS: PHASE THREE

DATE	ADVANCED	H.I. A	H.I. B	L.I. A	L.I. B	H.B. A	H.B. B	L.B. A	L.B. B	PRE-LIT	LEVEL 4	LEVEL 3	LEVEL 2	LEVEL 1	TOTAL STUDENTS USING COMPUTER
10/01/90	3.0	6.0	8.0	4.0							3.0	14.0	4.0	0.0	21.0
10/02/90	6.0	4.0	6.0		4.0		4.0				6.0	10.0	4.0	4.0	24.0
10/03/90	7.0	6.0		4.0	6.0			4.0			7.0	6.0	10.0	4.0	27.0
10/04/90	9.0	4.0	6.0			2.0					9.0	10.0	0.0	2.0	21.0
10/05/90	5.0	2.0		4.0					2.0		5.0	2.0	4.0	2.0	13.0
10/08/90	4.0	4.0	8.0	4.0						4.0	4.0	12.0	4.0	4.0	24.0
10/09/90	4.0	8.0	8.0		4.0		4.0				4.0	16.0	4.0	4.0	28.0
10/10/90	6.0	4.0		2.0	3.0			4.0			6.0	4.0	5.0	4.0	19.0
10/11/90	5.0	4.0	6.0		2.0						5.0	10.0	2.0	0.0	17.0
10/12/90	8.0	3.0		2.0					2.0		8.0	3.0	2.0	2.0	15.0
10/15/90	2.0	6.0	6.0							4.0	2.0	12.0	0.0	4.0	18.0
10/16/90	2.0	6.0	6.0		2.0		5.0				2.0	12.0	2.0	5.0	21.0
10/17/90	6.0	4.0		2.0	3.0			4.0			6.0	4.0	5.0	4.0	19.0
10/18/90	6.0	4.0	8.0		2.0	4.0					6.0	12.0	2.0	4.0	24.0
10/22/90	2.0	5.0	3.0	2.0							2.0	8.0	2.0	0.0	12.0
10/23/90	3.0		5.0		3.0		2.0				3.0	5.0	3.0	2.0	13.0
10/24/90	5.0	4.0		3.0	1.0			6.0			5.0	4.0	4.0	6.0	19.0
10/25/90	8.0	3.0	6.0		3.0	4.0					8.0	9.0	3.0	4.0	24.0
10/26/90	11.0	2.0		2.0					5.0		11.0	2.0	2.0	5.0	20.0
10/29/90	3.0	3.0	4.0	2.0							3.0	7.0	2.0	0.0	12.0
10/30/90	8.0	6.0	4.0		2.0		4.0				8.0	10.0	2.0	4.0	24.0
10/31/90		6.0			6.0						0.0	6.0	6.0	0.0	12.0
11/01/90	6.0	4.0	2.0		2.0	3.0					6.0	6.0	2.0	3.0	17.0
PHASE THREE MEAN	5.2	4.5	5.7	2.8	3.1	3.3	3.8	3.6	2.3	4.0	4.4	6.8	2.7	2.5	16.4
OVERALL MEAN	4.7	3.9	5.1	3.5	3.3	3.0	3.8	3.1	2.3	3.0	4.0	5.5	3.1	2.0	14.6

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Appendix Q

MEAN PERCENTAGE OF ATTENDING STUDENTS USING COMPUTERS

	ADVANCED	H.I. A	H.I. B	L.I. A	L.I. B	H.B. A	H.B. B	L.B. A	L.B. B	PRE-LIT	LEVEL 4	LEVEL 3	LEVEL 2	LEVEL 1	STUDENTS TOTAL
ATTEND LAB PHASE TWO MEAN	28.2	34.5	33.3	27.6	27.6	20.5	26.6	29.8	20.4	20.8	25.1	46.7	28.6	20.3	120.8
USE COMPUTER PHASE TWO MEAN	4.3	3.4	4.5	4.2	3.5	2.7	3.8	2.7	2.3	2.0	3.5	4.3	3.6	1.5	12.8
PERCENT USING PHASE TWO	15.31%	9.71%	13.39%	15.11%	12.80%	13.01%	14.10%	8.95%	11.44%	9.64%	14.03%	9.11%	12.42%	7.29%	10.61%
ATTEND LAB PHASE THREE MEAN	25.2	30.6	32.8	22.5	23.9	20.2	22.8	29.2	22.7	18.8	21.5	44.3	26.6	19.4	111.7
USE COMPUTER PHASE THREE MEAN	5.2	4.5	5.7	2.8	3.1	3.3	3.8	3.6	2.3	4.0	4.4	6.8	2.7	2.5	16.4
PERCENT USING PHASE THREE	20.52%	14.55%	17.48%	12.53%	12.87%	16.09%	16.67%	12.33%	9.93%	21.28%	20.52%	15.38%	10.31%	12.81%	14.72%
ATTEND LAB OVERALL MEAN	26.7	32.6	33.1	25.0	25.8	20.4	24.7	29.5	21.5	19.8	23.3	45.5	27.6	19.9	116.3
USE COMPUTER OVERALL MEAN	4.7	3.9	5.1	3.5	3.3	3.0	3.8	3.1	2.3	3.0	4.0	5.5	3.1	2.0	14.6
PERCENT USING	17.77%	11.98%	15.42%	13.95%	12.83%	14.54%	15.28%	10.62%	10.64%	15.17%	17.02%	12.16%	11.40%	9.98%	12.58%

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PERCENTAGE OF POPULATION USING COMPUTERS: PHASE TWO

DATE	ADVANCED	H.I. A	H.I. B	L.I. A	L.I. B	H.B. A	H.B. B	L.B. A	L.B. B	PRE-LIT	LEVEL 4	LEVEL 3	LEVEL 2	LEVEL 1	TOTAL POPULATION	MEAN USE TOTAL PERCENT
NUMBER IN CLASS	46	42	52	46	27	40	36	52	31	39						
NUMBER IN LEVEL	46		94		73		76		83	39	46	94	73	198	411	
USED COMPUTERS	5	2	3	1	4	2	0	0	0	0	5	5	5	2		
PERCENT OF CLASS	11	5	6	2	15	5	0	0	0	0						
PERCENT OF LEVEL	11		5		7		3		0	0	11	5	7	1		
WK 1 8/27-8/31																
USED COMPUTERS	7	4	4	0	4	0	0	0	0	0	7	8	4	0	19	5
PERCENT OF CLASS	15	10	8	0	15	0	0	0	0	0						
PERCENT OF LEVEL	15		9		5		0		0	0	15	9	5	0		
WK 2 9/4-9/7																
USED COMPUTERS	16	8	11	5	4	0	2	0	2	0	16	19	9	4	48	12
PERCENT OF CLASS	35	19	21	11	15	0	6	0	6	0						
PERCENT OF LEVEL	35		20		12		3		2	0	35	20	12	2		
WK 3 9/10-9/14																
USED COMPUTERS	21	9	13	21	15	4	6	2	3	0	21	22	36	15	94	23
PERCENT OF CLASS	46	21	25	46	56	10	17	4	10	0						
PERCENT OF LEVEL	46		23		49		13		6	0	46	23	49	8		
WK 4 9/17-9/21																
USED COMPUTERS	17	17	11	10	7	0	4	4	2	0	17	28	17	10	72	18
PERCENT OF CLASS	37	40	21	22	26	0	11	8	6	0						
PERCENT OF LEVEL	37		30		23		5		7	0	37	30	23	5		
WK 5 9/24-9/28																
USED COMPUTERS	34	21	19	14	16	2	3	2	0	2	34	40	30	9	113	27
PERCENT OF CLASS	74	50	37	30	59	5	8	4	0	5						
PERCENT OF LEVEL	74		43		41		7		2	5	74	43	41	5		
MEAN TOTAL % OF PHASE TWO																17

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Appendix R

PERCENTAGE OF POPULATION USING COMPUTERS: PHASE THREE

DATE	ADVANCED	H.I. A	H.I. B	L.I. A	L.I. B	H.B. A	H.B. B	L.B. A	L.B. B	PRE-LIT	LEVEL 4	LEVEL 3	LEVEL 2	LEVEL 1	TOTAL POPULATION	MEAN USE TOTAL PERCENT
WK 6 10/1-10/5																
USED COMPUTERS	30	22	20	12	10	2	4	4	2	0	30	42	22	12	106	26
PERCENT OF CLASS	65	52	38	26	37	5	11	8	6	0						
PERCENT OF LEVEL	65		45		30		8		7	0	65	45	30	6		
WK 7 10/8-10/12																
USED COMPUTERS	27	23	22	8	9	0	4	4	2	4	27	45	17	14	103	25
PERCENT OF CLASS	59	55	42	17	33	0	11	8	6	10						
PERCENT OF LEVEL	59		48		23		5		7	10	59	48	23	7		
WK 8 10/15-10/18																
USED COMPUTERS	16	20	20	2	7	4	5	4	0	4	16	40	9	17	82	20
PERCENT OF CLASS	35	48	38	4	26	10	14	8	0	10						
PERCENT OF LEVEL	35		43		12		12		5	10	35	43	12	9		
WK 9 10/22-10/26																
USED COMPUTERS	29	18	14	7	7	0	2	6	5	0	29	32	14	13	88	21
PERCENT OF CLASS	63	43	27	15	26	0	6	12	16	0						
PERCENT OF LEVEL	63		34		19		3		13	0	63	34	19	7		
WK 10 10/29-11/1																
USED COMPUTERS	17	19	10	2	10	3	4	0	0	0	17	29	12	7	65	16
PERCENT OF CLASS	37	45	19	4	37	8	11	0	0	0						
PERCENT OF LEVEL	37		31		16		9		0	0	37	31	16	4		
MEAN TOTAL PERCENT OF PHASE THREE																22
MEAN TOTAL PERCENT OVERALL PROJECT																20

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